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ORIGINAL ARTICLES

GOITER*

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The development and structure of the body have always been a most interesting study and it has become a most fascinating one since our advancing knowledge of the former "wonder glands" of the body shows that they are the real architects and builders and that they control many of the most important functions of the body. When this knowledge was first acquired, to each gland was attributed an exact and sole duty, but it is now known that the functions of these glands, especially those of the ductless group, are intimately correlated. They each have a great preponderance of control over certain functions, causing typical disease when one is deranged or absent, and atypical disease when a derangement in function of possibly two or more of the associated glands occurs. All of the animals are supplied with these controlling bodies in some form and, while the substance of the gland remains the same in character, the location and presence of the capsule varies somewhat.

In the human being the thyroid is of utmost importance, and the first bud of its development can be seen in the human embryo of 4 mm. Formerly supposed to develop from three anlages, it is now known to be wholly formed from the median one, originating between the three divisions of the tongue, from which point it descends in the neck to its resting place astride the anterior upper trachea. It consists of two lateral lobes and an isthmus. Anomalies are caused by failure of the gland to develop, by its continuing its fetal form as permanent structure, by failure to leave its original location (as lingual thyroid), by portions breaking off in the descent (attached or completely carried away), thus causing accessory or aberrant thyroid, or the rather common occurrence of becoming entangled in the developing hyoid bone,

* Read before the Chicago Medical Society, Oct. 31, 1912.

stringing out a portion of the gland known as the pyramidal lobe. Sometimes, though rarely, pharyngeal embryonic mucosa is drawn down in the line of descent causing the so-called thyroglossal duct cyst. Because of the disappearance of the thyroglossal duct which occurs in the early development in the human being it was believed that this gland in some less developed animal life delivered through a duct, like the submaxillary gland, and, while long looked for, was finally found by Gaskell. In his search for the highest form of development in invertebrate animals he shows that this surface delivery does occur in some of them such as the limulus, sea scorpion, king crab, ammocetes, et al. As has been suggested by MacCarty, the best place for the further study of this gland is in this type of animal, although singularly enough in them it delivers into the genital tract. The next advance in our knowledge will come through finding the animal invertebrate or vertebrate in which the duct disappears.

We can readily see that the structure of this gland is most important when we consider that its blood supply arises from approximately the same sources as the vessels supplying the circle of Willis, and that its vascular area is the same as that for the brain. Under certain conditions of thyroid activity the vessels supplying it enlarge considerably. The secretion of the gland is in the nature of an iodo-thyroglobulin.

The mother's thyroid undoubtedly influences the growth of the child in utero. A babe without functionating thyroid at birth appears normal and the failure of this function requires several months to make itself manifest. When thyroid is fed to those deficient of it through birth, operation or disease, it improves their condition. We can more readily understand its relation as an associated sex gland in the higher animals and human beings from the genital tract position of the thyroid in the higher invertebrates. This is noticeable in the goiters of adolescence and lesser enlargements which are so common at puberty when the ovaries and uterus take on development, in the slight increase in size through congestion preceding menstruation which is so often noted, in the frequent thyroid symptoms during the early months of pregnancy due to extra demands upon its secretion, and in the symptoms of varying hyper- and hypo-function seen at the menopause. Again we not infrequently see a lessened catamenia with an increase in weight and sterility between the ages of 25 and 40, which is often apparently due to a decreased activity of the thyroid. In such cases thyroid feeding at times seems to improve their condition.

It may be said that these statements are but clinical observations. They do, however, offer a most inviting field for investigation in order that we may be supplied with more accurate knowledge.

In the human being the gland weighs from one to one and one-half ounces. There is, however, a large factor of safety provided in all of these structures which would indicate that a portion of the gland, stated as probably one-sixth, would be sufficient to furnish the necessary secretion. There is a wide variation in the structure of the ductless glands, due to failure to completely develop, and to various forms of degen-

eration which occur after development has been completed, without sickness or symptoms. According to Lorand the deferring of old age requires the continued presence of some of the thyroid throughout life. The cretin is the child without thyroid from birth. The loss of thyroid in the adult causes myxedema.

It can be readily recognized then that transplantation of the gland from similar beings has become a fruitful field of experimentation. Previous to the antiseptic period transplantations of all sorts were almost impossible, but, through antiseptic and aseptic detail, skin, bone and conveying structures, such as nerves, have been transplanted. More recently, through better technic, blood-vessels and glands also have been transplanted. Such transplants seem to fulfil their purpose, although the original tissue may no longer exist, but has formed a framework for tissues which permit of a "near-function." In transplanting glands it is at once realized that we are dealing with the highest type of tissue, the next thing to brain substance. They have a function not unlike the brain, only they transmit their influence by wireless hormones instead of nerves, and while the temporary effect may be marvelous through the hormones of this secretion its permanency is rarely seen, its benefits lasting only a short time after the disappearance of the structure through phagocytic activity or true degeneration. Usually a necrosis of the center occurs—a degeneration which gradually spreads to the periphery of the transplanted gland. Naturally we would expect but temporary relief in transplanting from one animal to another or to a human being in whom there is a leaking of the blood.

Concerning the etiology of goiter much has been written, but there is little as yet which seems positive; the most commonly accepted theory is that it is a water-borne irritant which acts on the gland. In our own country patients come from every state with every possible differing water-supply and surroundings, as well as elevation.

It is impossible in the human being to describe just what constitutes a strictly "normal" thyroid; there are conditions of the gland which must nearly approach it and wide variations from it which apparently give no symptoms. It is evident that an increased secretion of the gland occurring with increased parenchyma must often be neutralized in the body, as symptoms do not always manifest themselves until some shock or break in the equilibrium of the nervous system renders the condition apparent. It is also evident that less thyroid seems to be necessary in advancing years.

It would appear that the disease is on the increase according to the increasing number of operations that are being made for goiter. It must be remembered, however, that many of these patients have had the goiters from ten to twenty years, so the percentage of operation is greater now than it will be a few years hence. Over 1,000 operations for goiter were made at St. Mary's Hospital during the past ten months.

While the thyroid gland is subject to frequent diseases which increase its size, only a small percentage of such enlargements are malignant.

Most of them are so-called simple goiters and conform to the normal outline of the gland. Others, however, appear as a rounded tumor growth or as an irregularly developed tumor consisting of an adenoma or of adenomas.

The goiter of adolescence is an edematous condition of the gland due to watery colloid. This type often disappears with or without treatment and seldom requires operation. Iodin is very effective in these cases.

Figure 1

Simple goiter and adenoma through degeneration coming from natural causes or induced by the stimulation of iodin in long-standing goiters may produce the symptoms of a toxemia with attendant effects on the heart, kidneys and liver. These cases may have all the nervous symptoms and heart complications of a bad case of Basedow's disease without the protruding eyes. Operations on them are fully as serious as in the ordinary case of Graves' disease.

Exophthalmic goiter or hyperthyroidism are terms which have been applied to a disease which is recognized by a group of varying symptoms which have been described for the past 150 years, at first as Morgagni's disease, then Parry's disease, Moebius' disease, later Graves' and then Basedow's. It was not until 1885, when Moebius attributed the condition to a derangement of function of the thyroid gland, that a true advance in knowledge was made. As is shown in the pathology of the thyroid some

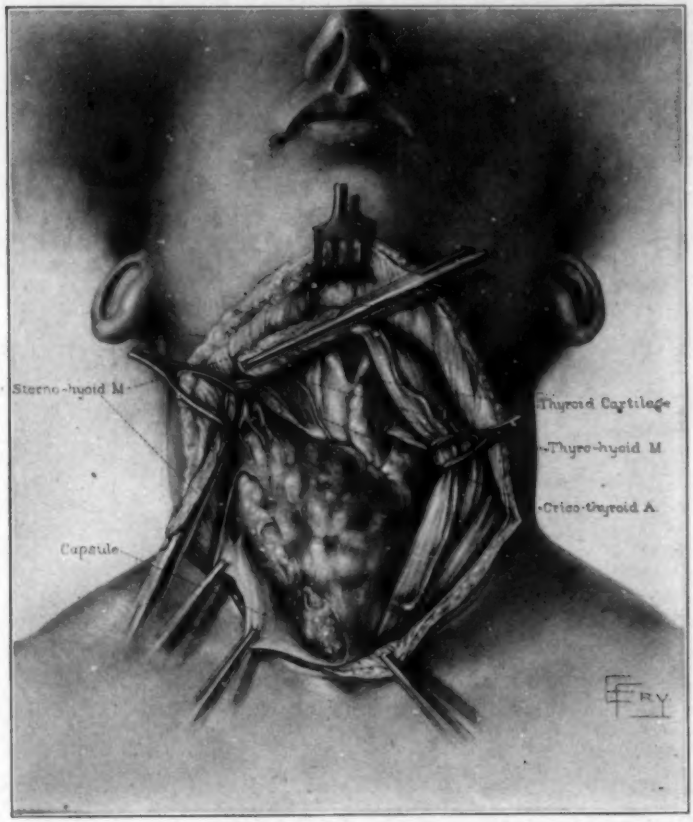

Figure 2

cases present a general increase in the parenchyma, while in others it is in scattered areas. There is a variation in the nervous system of the individual effected by the hyperactivity of the gland, so one may look for all degrees and stages of this chronic disease which has now, however, become quite generally accepted throughout the world as amenable to surgical treatment.

There is no question but that Graves' disease is a chronic malady and only occasionally runs an acute course to termination. According to

Plummer's observations there seems to be a period of ascent during the first few months before the heart dilates. After this occurs the patient continues in a serious condition until about the end of the first year. During the second year the case can be classed as a chronic one subject to fluctuations. Possibly the most critical period is the few months following the first dilatation of the heart. While the large majority of cases can be easily diagnosed from the nervous symptoms,

Figure 3

tachycardia, goiter and eye symptoms, there are a few cases in which it is difficult to diagnose true hyperthyroidism from pure neurasthenia, myocarditis or Bright's disease, as well as a few cases in which there may be a complication by affection of the hypophysis, thymus or adrenals. These cases are not relieved by operation on the thyroid. Rehn, of Frankfurt, believes that the most serious cases are complicated by thymus disease as well. In them he removes this structure if present.

We have made it a practice not to treat the serious cases as subjects for emergent surgery, but tide them through these temporary exacerbations. In the most severe cases we ligate the superior blood-supply, sometimes in two stages, and later do a thyroidectomy. The average gain in weight of this group after ligation is 22 pounds during the first four months. A thyroidectomy then becomes a very safe procedure.

Figure 4

The anesthetic of choice is ether for general surgical operations. It works very well in simple goiters and also in the majority of cases of hyperthyroidism. By reason of complications, disease of the kidneys, heart or lungs, tracheal pressure or high blood-pressure, a local anesthetic may be indicated. In some cases it is advisable to secure the benefits of

combined anesthesia by the injection of ½ per cent. novocain followed by a light general anesthetic. In using ether it is advisable to give the patient 1/120 of a grain of atropin and a small quantity of morphin one hour before the operation. The atropin keeps the pharynx and trachea dry. In very severe cases of hyperthyroidism the giving of 1/200 of a grain of scopolamin with ⅛ grain of morphin does much to quiet the apprehensiveness of the individual.

Operation: In ligating the blood-supply of the gland the vessels of the superior group are chosen because of their accessibility. The inferior thyroid vessels are usually ligated in cases where a serious relapse occurs between the ligation of the superior vessels and the proposed thyroidectomy. The transverse incision across the center of the thyroid cartilage is employed for ligation of the superior vessels, as here there is freedom from the possibility of nerve injury. The anterior border of the sternomastoid muscle is exposed and drawn outward, clearing the outer edge of the omohyoid, which is drawn inward. This brings into view the upper pole of the thyroid gland. The ligature is placed at the pole or slightly on the gland. This prevents the reversal of circulation in one of the large branches of anastomosis with the inferior which occurs when the vessel is ligated higher up. One or both sides are ligated at the same time according to the conditions and the necessities of the case.

Extirpation of the gland or resection is made by a transverse incision, passing from one external jugular vein to the other in a natural skin crease low in the neck. The skin and platysma muscle are lifted upward as a single flap, exposing the general outline of the gland, which is now brought into view by dividing vertically between the sternohyoid and thyroid muscles. (Fig. 1.) The true capsule of the gland is recognized as the one containing the blood-vessels; false or fibrous capsules do not have them. (Fig. 2.) Usually the lobe to be removed can be elevated between these muscles as they are stretched, but in large goiters and in exophthalmic goiters it becomes necessary to cut the muscles on the one side, rarely on both. They should be cut between two forceps which are placed near the upper part of the muscle, nearly to the top of the skin dissection, as this procedure preserves the body of the muscle with its nerve-supply and breaks the line of penetrating muscle-moved scar so disfiguring after some operations. The lobe to be removed is now elevated and its vessels caught and cut between forceps, many being applied, as all vessels do not need ligating and often several can be caught in one ligature. (Fig. 3.) This method seems preferable to the immediate application of double ligatures unless the number of forceps which it is necessary to use becomes a hindrance. The high division of muscle gives ready access to the superior thyroid artery which, after being divided, permits of the rotation of the lobe across the trachea, where it is usually separated at the merging of the isthmus into the left lobe unless it is desired also to remove part of the lobe. In very large goiters causing tracheal pressure it is often advisable to divide the left sternohyoids as well as to free the trachea by dividing the isthmus, the central portion of the gland being removed by turning the lobes outward. This operation

is somewhat more bloody, but quite safe as the trachea is exposed early. Catgut is efficient suture material. Silk is less pleasant to handle. (Fig. 4.)

Tubular drainage is employed for twenty-four hours, except in large substernal goiters, when the drain is removed within a few hours in order that the organization of the early blood clot may occur to aid the primary closure of the large cavity.

To prevent the possibility of tetany the epithelial or parathyroid glands must be avoided in the course of an operation and preserved even if it be necessary to replace accidentally separated ones. These bodies, four in number (two on each side), are known to be occasionally injured by hemorrhages into them at birth, so it is impossible to say whether or not the parathyroid bodies are all present and whether or not the one or two that we may injure are the only ones existing. It is advisable therefore to keep in front of the posterior capsule or very close to it in extirpating the diseased portion of the thyroid gland and not to remove any small gland-like structures.

However, those surgeons whose patients have had tetany following operations for goiter have probably removed the lateral lobes of the thyroid and left an isolated bit of the isthmus without blood-supply. Even if the parathyroids were not removed their circulation had been destroyed. Those cases reported have usually recovered after a tedious convalescence and in spite of much experimentation.

The mortality in simple goiter is but a fraction of 1 per cent., while that of exophthalmic goiter varies from 1 to 2 per cent.

Relapses occasionally follow the removal of adenomas. They are also observed in some cases of Graves' disease due to an insufficient removal of gland or to an increase in what was left which may not show or cause symptoms for some years after the primary extirpation. The indications are to remove more of the gland.

DISCUSSION

Dr. Arthur Dean Bevan: We have cause for congratulation on having with us to-night the man who next to Kocher has done more in the last ten years to throw light on the clinical side of exophthalmic goiter than any one else. Dr. Mayo has had an unusual opportunity to study this subject both from the clinical as well as the pathologic side, and the work has been very thoroughly done.

So far as Dr. MacCarty's paper is concerned, it seems to me that his classification is rather complicated. I cannot criticise his paper because I have not devoted enough time to the study of the pathology of goiter, but he has shown the difficulty of making a classification even from the pathologic standpoint and of applying that classification to clinical work. I am rather inclined to the belief that clinicians must have something more simple than he has given us to-night.

Confronted with a clinical case it has always appeared to me that the questions that must be answered, in a case of enlargement of the thyroid, are as follows: Is it an enlargement, purely physiologic in character, such as we find in adolescence; is it a simple struma; is it an exophthalmic goiter, a goiter associated with symptoms of hyperthyroidism; or is it a malignant struma? If it is a simple struma, is it nodular and irregular or is it smooth and regular? Is it a fetal adenoma, or is it a colloid goiter or cyst? We must make a clinical classification because on that depends the treatment to be employed.

I can remember very well as a student of Moses Gunn and Charles T. Parkes how little was known of goiter twenty-five years ago. We were much interested in the work of William Warren Greene, the then professor of surgery in the University of Michigan, who performed the first operations for goiter that amounted to anything. He did them with few artery forceps, cutting out the goiter with one or two sweeps of the knife, and then came a scramble to ligate the vessels. In the first eight cases the mortality was exactly 50 per cent. To-day, thanks to the work of Kocher and Mayo, we can tell our patients that the operation in simple struma is attended by a mortality of less than 1 per cent. That, I think, is one of the triumphs of modern surgery.

In the simple physiologic enlargements of the thyroid, which occur so commonly in adolescence, we have at our command in the treatment very good agents, such as iodin, general hygiene, and time. They seldom demand operative intervention. In simple struma, iodin, in the great majority of cases in the adult, is the therapeutic agent that should be employed. Kocher believes that it will cure the majority of these cases Of course, that means the ordinary diffuse struma, not a struma where pressure symptoms exist, where there is danger that with the increase of growth pressure symptoms will be serious. Where the enlargement is so great that it is a deformity we can safely tell the patient that the operation is the best method of treatment, and we can urge the patient to submit to an operation.

When you are dealing with the exophthalmic variety of thyroid, you are tackling a different problem. I believe, however, that medical men generally should be convinced of the fact that to-day surgical treatment gives better results in this variety than medical management. The results will, however, depend largely on the judgment and the skill and experience of the man handling the case. In brief, these facts must be recognized. The time has come when we should say to the patient, as we do in appendicitis, that early operation is the safest, before serious heart changes have taken place. In the minor cases ligation; in the more severe cases removal of the larger portion of the gland. In the more serious types of exophthalmic goiter, whenever the patient can walk around the block, whenever the heart is sufficient to enable him to walk a quarter of a mile, the patient is well enough to stand the effects of the operation of removal of a part of the gland.

The mistakes made are in those cases where the patient is not a good surgical risk for any operation, not alone thyroidectomy, partial or complete. There are many such cases, where we must trust to the opportunity of getting the patient on the wave of improvement. In these serious cases, the preliminary ligation is the operation that should be done; later, if possible, we may remove a part of the gland. The fatal cases are those where we try to do too much or where the patient is not in condition to warrant an operation. I would also like to emphasize the fact that there are patients whose condition is such that no operation at all should be undertaken. Some of these patients are in such shape that no matter what type of operation you perform, failure to cure is the inevitable result.

In the whole matter of exophthalmic goiter, so far as surgery is concerned, let us be honest with ourselves in reporting results. Cures by surgical means are relative. They are almost never perfect. In almost all of the cases there is some evidence of the disease remaining. That, however, does not in any way detract from the great benefits that are offered us by surgical means in these cases.

As far as carcinoma of the gland is concerned, I must admit that I have had very bad results in my cases. I am almost of the opinion that carcinoma of the thyroid is one of the least favorable conditions of carcinoma anywhere in the body for a radical cure. At the same time we must occasionally do an operation to give the patient relief, but most of these operations are palliative.

I cannot refrain from again expressing my great appreciation and interest in the two papers we have heard read to-night.

Dr. A. J. Ochsner: I am very glad to have heard these two papers. I will touch on but a few points. Dr. MacCarty and Dr. Wilson have given the patho-

logic side of this question a great impetus by their very careful and painstaking studies, and clinically we have been able to confirm all that they have observed during the past few years. They have done most valuable work, and I hope that they will continue in their efforts to throw light on this subject.

The protection of the recurrent laryngeal nerve, of which Dr. Mayo spoke, is of great importance. I have been impressed with the fact that a number of surgeons have almost no paralysis or partial paralysis of the recurrent laryngeal nerve, while other surgeons, some of the very best, have ten and fifteen, and one as high as 50 per cent. of disturbance of the recurrent laryngeal nerve. I have seen the work of several of these surgeons, and I am convinced that it is their attempt to protect this nerve that has caused the disturbance.

In several of these clinics the nerve is systematically exposed in order that it may not be injured. Dr. Mayo has advised to protect it by remaining in front of it, in front of the posterior capsule of the thyroid, and if you do this, you will have less than 1 per cent. of disturbance. It is absolutely unnecessary to expose this nerve. Of course, protecting the nerve in that way, also protects the parathyroid glands.

Another interesting fact has been brought out by Wilms, who for many years has made a careful study of the effect of water on the thyroid. It was demonstrated by Kocher that there are certain goiter wells, a fact which has been confirmed all over the world. Wilms' assistant, Bircher, demonstrated that in Switzerland the water which comes from soil composed of granite does not cause goiter, while the water which passes through earth which was at one time submarine will cause goiter. These soils may be a mile apart, as at Grindelwald. University students who come from goiter districts, during their stay in the university are very likely to develop symptoms of hyperthyroidism. A study of this condition has been made, and it was found that when these same students were sent back to their goiter water, they lost their exophthalmic symptoms.

The explanation has been worked out in this way, that the goiter is a compensatory physiologic product. In other words, the goiter water demands the production of more of the thyroid material or secretion; consequently the goiter is produced. When the student enters the university, where the water is free from this irritant, he has too much thyroid secretion, and he develops exophthalmic goiter.

Dr. Charles H. Mayo, closing: There are still many things to be learned about the thyroid. Dr. Bevan touched upon an important point when he said we must not operate on these patients with the expectation of cure when they are in the last stages of the disease. Operating on the goiter at this time will not cure atrophy, myocarditis, nephritis, etc., and it is because we have not paid enough attention to this point that our knowledge of the pathology of the thyroid has advanced slowly.

Dr. Ochsner has referred to the injury of the recurrent laryngeal nerve as occurring at times from too freely exposing it in endeavoring to protect it. I find that few surgeons make a routine practice of examining the vocal cords before operation. You will find quite a large percentage of people who have a paresis of an adductor or abductor on one side that is not at all noticeable in ordinary conversation. The voice may tire, and great effort may cause it to disappear entirely temporarily. Even after injury by operation the voice may return after three months for ordinary conversation. The other cord will come two-thirds across to meet it. If it be known before operation that paralysis exists, the patients should be told that they may lose their voice for a time. It is difficult to suture the recurrent laryngeal nerve after it has been cut. When operating on these cases it is important to see the nerve only when there is a tumor that runs underneath the trachea. Right sided round-ball tumors will as frequently produce paralysis of the left as the right nerve. The left nerve will not stand traction. It passes around the arch of the aorta and the posterior edges of the tracheal rings impinge on the nerve. Paralysis is more frequent on the left than on the right side.

Many of these patients consult a surgeon because of cosmetic reasons. They have a large symmetrical goiter and, if it be removed on one side, the neck will look as bad as before. In such cases a resection should be done, dividing the isthmus, removing the inner portion of each lobe, and building up two new lobes for a symmetrical neck.

Do not drain the large substernal goiters. Try and get the organization of the blood-clot. You can recognize these cases by the enlarged veins in the neck. The diagnosis can often be made without the Roentgen Ray. Usually they are of the adenoma type and are not serious cases to operate on.

In all the exophthalmic cases, there are periods of temporary improvement. Goiters may be arrested in all stages of their growth. Medical men should write on the cure of diseases of this gland because internists have not come together on the treatment of these cases for 150 years.

Dr. MacCarty, closing: I am very glad that Dr. Bevan said what he did. It allows me to say what I could not put into the paper. He said that my scheme is too complicated. It is in reality so simple that two high school girls, who have never studied medicine can readily classify goiters. The clinician has been making much more accurate diagnoses since he has been given descriptions of the conditions present. The clinical diagnoses are really pathologic diagnoses. We do not see the old fashioned diagnoses of simple goiter, exophthalmic and fetal adenoma. The scheme is not complicated. It is very simple and I am sure that if Dr. Bevan would study it for about twenty minutes, he would agree with me.

A PLEA FOR IMPROVED HYGIENE IN THE MANAGEMENT OF SURGICAL TUBERCULOSIS *

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While much yet remains to be done, we have made substantial progress as shown by the better education of the people, as to the nature, tuberculosis in this climate. At that time, tuberculosis was regarded as an incurable disease, or if curable, as only possible in certain favored climates. The work of the past eight years, in which I have been so generously supported by the medical profession, has enabled us to demonstrate the curability of tuberculosis in this climate, and by so doing, to a large measure, overcome that hopeless apathy, which has hitherto characterized our attitude towards this terrible scourge.

While much yet remains to be done, we have made substantial progress as shown by the better education of the people, as to the nature, causes, prevention and treatment of this disease. One of the tangible evidences of the marked change which has taken place in this comparatively short time, is the fact that every state touching our borders has one or more institutions for the treatment of tuberculosis, and that in our own state, several are already in existence, and preliminary steps are being taken for the erection of many more. In fact, every community almost is discussing more or less seriously the question of making institutional provision for the treatment of pulmonary tuberculosis.

* Read before the Chicago Surgical Society, Nov. 1, 1912.

I appear before you on this occasion to make a plea for an enlargement of our work and to secure, if possible, your cooperation by including in our field of operations what, I think all will agree, is an improvement in the treatment of the so-called surgical forms of tuberculosis.

Medical men, the world over, are in substantial accord as to the treatment of pulmonary tuberculosis. I have been impressed, however, for some time that the methods of treatment of surgical forms of this disease in this country and in Europe are radically different. In order to secure reliable information, I recently visited several European countries for the purpose of securing information as to their methods.

France was the first country in the world to attempt the treatment of tuberculosis in children by hygienic and dietetic methods. A detailed description of their methods is set forth in a recent article published in the *Chicago Medical Recorder*, entitled "The Marine Hospitals of France; A Visit to Berck," which I think all of you have received, or if not, I shall be pleased to place in your hands.

It will be noted by the article referred to, that in France great stress is laid on the beneficial effects of sea air, and by inference we are led to believe that this is absolutely necessary.

Probably the best institution in Switzerland for the treatment of surgical tuberculosis, is at Leysin, where they are equally successful at an altitude of 4,000 feet, and there the beneficial results are attributed wholly to the mountain air, altitude and sunshine.

In Germany they obtain equally good results in the open country away from the seashore and at a moderate altitude.

In England the results are equally good, practically at sea level, and in what is regarded as a rather unfavorable climate.

Thus we see that history is simply repeating itself. We are passing through the same experience in the evolution of the treatment of surgical tuberculosis as we have just passed through in the treatment of pulmonary tuberculosis.

In Europe, and especially in France and Switzerland, the treatment is almost wholly hygienic and dietetic. Comparatively little surgery is resorted to. It is unnecessary for me to call your attention to the fact that in this country operations are the rule and that hygienic and dietetic treatment is exceptional except as imperfectly carried out in the home and general hospitals. So far as I know, there is only one small institution in this country devoted exclusively to the treatment of surgical tuberculosis by the methods which are practiced in Europe. This is not because the surgeons of this country do not recognize the value of hygienic methods, but for the reason that they must accept the only means provided, which is the general hospital. My personal opinion is that the Europeans have relied on the hygienic treatment to the exclusion of operative procedures, and that the American surgeon, not from choice, but from necessity, has been compelled to largely restrict his management of these cases to purely surgical interference. This opinion is borne out by the later text-books on this subject.

In the last edition of Sir W. Watson Cheyne's work on "Tuberculous Diseases of the Bones and Joints," he says:

While there is very little to alter or add as regards the morbid anatomy and pathology of these diseases, there is no question that operative interference is very much less frequently employed at present than it was at the time when the first edition was published. When the tuberculous nature of these diseases was first demonstrated, the views as to the prognosis of tuberculosis were much more gloomy than they are at the present time, hence operations were very largely carried out with the view of attempting to eradicate the disease as well as to obtain a good functional result. Since that time, however, experience has been accumulating and has shown that with careful hygienic and local treatment, the outlook of tuberculosis, especially of the forms met with by the surgeon, is more favorable than was at that time thought, and the frequency of operation, especially at the early period of the disease, and in the absence of suppuration has been steadily diminishing. Indeed, the pendulum is tending to swing rather too far in the conservative direction, and I have attempted to take as far as possible a reasonable position between excessive operation on the one hand, and prolonged perseverance in conservative treatment on the other.

Ely in his recent work on "Joint Tuberculosis," says:

The general treatment includes diet, fresh air, exercise, and everything tending to improve the patient's nutrition. The bone lesion is to be regarded as a local manifestation of a constitutional disease, *and the treatment of it is influenced by this fact.* The patient must be kept under the best possible hygienic conditions. He must have fresh air all the time, good food, and careful attention to his digestion and other functions. The first requirement is that he be kept out of doors all day and sleep with his windows wide open at night. The wards of a city hospital are no place for cases of joint tuberculosis, and they do ill there. This has long been recognized. In theory the need of fresh air has also been recognized for some time, but in practice it is often neglected. . . . In former days when the idea of rest first obtained, patients were put to bed and were kept there for long periods but it was found that although the local lesion improved for a while, they soon suffered in general health. . . . Any treatment, no matter how attractive, is to be rejected if it keeps the patient long indoors.

He who believes that the diseased joint represents the entire disease in the body and that it must be attacked with the utmost vigor in patients of all ages, even if all the infected parts cannot be completely removed, will doubtless continue to practice the most radical means at his disposal. . . . He who regards the tubercular joint as a mere local manifestation of a general disease, and refuses on that account to operate, should, to be logical, direct his entire attention to constitutional treatment, and should refuse to avail himself of any means of local treatment whatever. Possibly it is the fallacy in the argument of one extremist that has raised up extremists on the other side. When those who practice invariable radical treatment, become more conservative, the conservatives may become more radical.

As far back as 1903, the British Society for the Study of Diseases in Children, passed the following resolutions:

Resolved, First, the Society for the Study of Diseases in Children desires to express the opinion that the conditions under which children suffer from surgical tuberculosis—that is to say, tuberculosis of bones, joints, glands and skin—as treated at the present are unsatisfactory in results and unscientific in plan.

Second, this society is convinced that the treatment of such cases in urban hospitals cannot be justified by the results, but is attended by much unnecessary suffering and by many preventable deaths. At present these hap-hazard methods are not economical but lead to a wasteful expenditure of time, energy, and of hospital funds.

Third. This society is of opinion that children suffering from surgical tuberculosis should not be treated in hospitals situated in cities or large towns, but in properly equipped institutions in the country or at the sea side. Such hospitals to be devoted to the treatment of such cases only, in the same way as open air sanatoria are devoted to the treatment of pulmonary tuberculosis.

The foregoing quotations from such eminent authorities together with our own experience, ought to be sufficient to convince skeptics, if any such there be. I take it for granted that it has been proven definitely that there is but one treatment of surgical tuberculosis, namely, constant fresh air, and all that is included in the modern method of treating pulmonary tuberculosis, together with orthopedic and conservative surgical treatment. It is perhaps a waste of time to discuss this matter, especially before such an intelligent body of medical men as is represented by this society. The most powerful agents in our possession for the inhibition and destruction of the tubercle bacilli are sunlight and fresh air and abundant nourishment. In the treatment of surgical tuberculosis, not only are mechanical and operative measures necessary, but all the accessory conditions of health are essential. Who has not observed the influence of darkness, poverty and vice on the general health, and yet how many realize the importance of securing the brighter and better conditions?

Early in the campaign against pulmonary tuberculosis, the plea for sanatorium treatment was based on the incipient case, on the assumption that it was not practicable to treat all stages of the disease in one institution. Many sanatorium physicians are now convinced that it is not only practicable, but in many respects even desirable and certainly far more economical than to provide separate institutions for the different stages of the disease. Personally, I believe that these institutions should not only make provision for all classes of pulmonary tuberculosis, but for surgical cases as well. In other words instead of being built for special forms of the disease, should provide for the treatment of tuberculous cases of every kind and character. It may be that I stand alone at present in taking this somewhat radical position, but I am fully persuaded that this will be the final solution of the sanatorium problem.

We are on the threshold of the construction of a large number of sanatoria for the treatment of pulmonary tuberculosis; therefore, if I am correct in the opinions expressed, now is the time to take the necessary steps to make provision in these institutions for the care of surgical forms of the disease. For example, on the outskirts of this city a large municipal sanatorium is being built for the treatment of pulmonary tuberculosis. If provision has not already been made, it should be, as I believe, for surgical cases, and likewise in every institution already in existence, and those which will be built in the future. Whether or not this plan is followed, it is high time that better provision should be made for those cases than is afforded by the general hospital. My experience in the treatment of surgical tuberculosis is too limited to warrant me in expressing an opinion, but in conversation with numerous surgeons I am led to believe that the present methods of treatment in vogue in this country

are exceedingly unsatisfactory. The patient is given the benefit of a splendid surgical operation, but without proper after-care. I am fully persuaded that the best results will be obtained if the splendid technic of the American surgeon is supplemented by proper hygienic dietetic after-care together with such additional advantage as may be gained by tuberculin, vaccines and other adjuncts to the treatment employed in pulmonary tuberculosis.

Surgeons cannot provide sanatoria for the care of their tubercular patients any more than they can general hospitals, nor have they time to devote to the treatment even if these are provided. It would seem to be a more practical way to co-ordinate the work of the surgeon and the physician. So far as I know, there is no precedent for this method, but this is no reason why it is not feasible. If pulmonary tuberculosis can be successfully treated in any climate or altitude near or remote from the sea, there is no reason why surgical tuberculosis cannot also. We were formerly taught that certain attributes of climate were essential in the treatment of pulmonary tuberculosis. These theories are all exploded and make it easier to disprove that either sea air or mountain air are essential to the treatment of surgical tuberculosis. The way to do a thing is to do it. This is what I am asking you to do. I am not pleading that all cases requiring treatment shall be placed in institutions, but only such as are now placed in the general hospital, or such others as may in the opinion of the surgeon, be more successfully treated if special facilities are provided.

The time at my disposal is too short to give the reasons for my contention. The objections that may be raised are purely theoretical and I feel that a practical demonstration is all that is needed to convince the most skeptical. To this end and to show my faith by my works, I have installed a fully equipped operating room in the new apartments which are just now completed at the Ottawa Tuberculosis Colony, which is placed at the service of surgeons who may desire to use it.

I have no disposition to invade the field of surgery. I do not believe it is now, or ever will be, practicable for sanatorium physicians to undertake operative procedures unless it may be those of a minor character. My scheme comprehends the co-ordination of the work of the surgeon and the physician in a plan which I believe will be to the distinct advantage of the patient and the mutual benefit of the surgeon and physician. The nature of the work is such that neither acting independently of the other can achieve the best possible results.

My purpose in presenting this subject for your consideration at this particular time, is that I believe you can give direction to a movement for the betterment of conditions affecting the class of cases in question and that this movement should have its origin with the surgeons by encouraging and demanding that better provision be made for their surgical cases. If we wait until the institutions which are destined to be constructed in the near future are completed, it will be more difficult and expensive to have the necessary changes and additions made to accommodate surgical cases. If we depend on separate institutions, it will

prove far more expensive and make the possibility for their care far more remote, hence a concerted movement now will not only hasten, but make more certain, the accomplishment of this object.

All I am asking of you is to place the after-care of your cases in the sanatorium instead of, as now, in the general hospital. If you encourage this plan, I feel assured that you will give a decided impetus to a movement for the better provision for this class of cases, and without your encouragement and assistance, a more rational treatment of surgical tuberculosis is in the dim, distant future.

No matter how apparent a thing may seem, there are always those who must be convinced by an actual demonstration before they will believe. I am simply asking you to assist me in making this demonstration.

Will this representative body of surgeons be the first to aid a movement which will doubtless mark an epoch in American surgery?

I have not thought it necessary to enter into an extended argument in support of my position. I rest my plea on a simple statement of facts. If you are familiar with the situation, no argument is needed. If not, I have faith that if you will investigate you will be in substantial accord with the views herein expressed.

I wish to thank you most cordially for this opportunity to present my views and hope they may receive that consideration at your hands which I believe the importance of the subject demands.

WHAT SHOULD BE DONE WITH TUBERCULOUS PUERPERAE AND THEIR CHILDREN?*

CHARLES S. BACON, M.D.
CHICAGO

According to the United States Census Mortality Report for 1909, about two women in a thousand of child-bearing age died of tuberculosis of the lungs. We may assume that the average length of life after acquiring the disease is from five to eight years. Of those who contract tuberculosis some recover and live many years, others die within a year or two. Our assumption of an average duration of life after infection is based on the conclusions of a large number of clinicians. There are then from 1 to 1.6 per cent. of women of child-bearing age with tuberculosis. It is generally agreed that tuberculous women are as liable to pregnancy as the non-tuberculous. Hence of the 60,000 pregnancies annually in Chicago that continue to viability of the child, 600 to 1,000 occur in tuberculous women.

I do not propose to discuss at length tonight the question of the management of pregnancy complicated with tuberculosis. Some contend that pregnancy should be interrupted in every case where the gravida has an active tuberculosis. It then becomes necessary to define what is meant

* Read before the Chicago Medical Society, Nov. 27, 1912.

by an active tubercular process. How long after the disappearance of fever or of bacilli in the sputum can we pronounce the patient free from an active tuberculosis. Generally we advise a patient to wait at least a year or better two years after the disappearance of fever and bacilli, before becoming pregnant. But if she become pregnant before the limit shall we recommend in all cases a therapeutic abortion?

The indications for interference are generally divided into two classes, the vital and the prophylactic. If a gravida is rapidly getting worse an operation may be done to save her life. Unfortunately the result is generally bad; she dies in a few weeks or months. If she is in the second half of pregnancy when the condition becomes dangerous it might be better to carry on the pregnancy till the child is safely viable and so save a child even if the mother succumbs.

The prophylactic indication is based on the assumption that the pregnancy, if allowed to continue to term, will make the tuberculosis worse, and that its interruption will not injure the patient as much as its continuance. Some have tried to explain the detrimental effect of pregnancy by attempting to show that in pregnancy there is a condition of lipoid anemia, a kind of cholesteremia that is favorable to the development of the tubercular germs. On the other hand, some clinical observers deny that pregnancy always stimulates the tubercular process and claim on the contrary that the increased nutrition, characteristic of pregnancy, frequently acts favorably on the disease.

It is generally admitted that the patient is apt to decline during the puerperium, even sometimes in mild cases. Perhaps the latent infection foci break down during the strain of labor or injuries or genital tract infection diminish the resistance of the patient.

The collected reports of the results of therapeutic abortion by individual observers are not very favorable. Veit found an absolute failure of the operation to improve the condition of the patient in 43 per cent. of cases collected by him. Tremblay, of Saranac Lake, who is an advocate of induction of therapeutic abortion and has made a larger number of operations than perhaps anyone else in the world, has had somewhat better results, but yet not such as to warrant the establishment of a general rule.

The social condition cannot be neglected. The chances of the patient are much better both during pregnancy and the puerperium if she can be properly cared for. A poor woman in a crowded tenement has much less chance than a well-to-do woman who can have the best of food and care. Without recognizing the "social indication" for inducing abortion the social condition is an element in the prognosis, and therefore a factor in the prophylactic indication.

Personally, I believe that there are a small number of cases—perhaps 10 per cent.—where therapeutic abortion is proper. Rarely it is indicated for the vital indication. Generally in the second half of pregnancy we should make every effort to bring the fetus to a safe viability term. In the first half of pregnancy if the patient, while under the most approved treatment, grows worse, as shown by fever, cough, loss of weight, hemop-

tysis, after allowing for the nausea of the second and third months, then abortion should be induced.

But whatever be our advice or our ideas of the interference with pregnancy, a considerable number of tuberculous gravidae will carry their children to term. Some would reject the advice of a physician because of a desire for children or because of ethical or religious considerations. There will probably continue to be over 500 tuberculous puerperae every year in Chicago.

These women and their children are most important foci for the spread of the disease and furnish one of the great obstacles to the fight against the white plague that is now engaging so much attention of the medical profession and the laity. Even if the patient comes to her confinement in good condition, the strain of labor reduces her strength. If she does not succumb, her convalescence is long. She must nurse her child, of course, and it becomes infected, either to perish in a few months or to carry a latent infection which later develops in childhood or early adult life.

Probably one-fourth of the 1,100 or 1,200 women of child-bearing age who die annually in Chicago from pulmonary tuberculosis are puerperae, or have passed through pregnancy within a year. Perhaps three-fourths of the 250 children under 5 years of age who die from tuberculosis every year in Chicago are born of tuberculous mothers.

With proper care much of this loss and danger can be avoided. Sometimes help must be given in the later weeks of pregnancy. Occasionally induction of premature labor is desirable. Labor should be managed so as to avoid all possibility of wound infection and prevent hemorrhage and all possible loss of strength. Then comes the period of greatest danger—the puerperium. The mother should have the best possible care that is afforded by the present system of management of tuberculosis. This implies especially rest, feeding, fresh, pure air and absence of worry. The latter item refers particularly to household worries and anxiety about the child. Nursing should not be allowed as a rule, because it is a drain on the strength of the mother and because it leads to the infection of the child. If it is found possible to get some milk from the breast by artificial means without weakening the mother it may be tried in the interest of the child. The puerperium, during which the mother should be kept under treatment, should be held to last three months after the birth of the child.

Managed in this way there is no doubt that very many puerperae that now are lost could be saved. It is obvious, however, that such a course of treatment as here indicated is now a great exception; even among the well-to-do this treatment is not carried out because its importance is not sufficiently recognized by the profession and therefore not recommended and insisted on. Among the poor it is of course an impossibility, unless the means are provided by the state or by charity. Probably there are over 300 tuberculous gravidae a year in Chicago who would require such assistance.

All will probably agree that proper care, such as has been outlined, can be given the poor only in sanitariums. The municipal and other dispensaries have done and are doing very valuable work in helping the tuberculous poor, in teaching them to care for themselves and avoid infecting others. But the tuberculous puerpera and her child cannot have at home the conditions that are essential to her recovery.

Although there are 30,000 hospital beds for consumptives in this country, yet there is no provision made for this class of patients. It seems somewhat strange that the importance of their part in spreading the disease has not been recognized by some effort to provide for them. I am glad to take up this matter now before it is too late to secure some provision in the new municipal sanitarium of this city. The Directors have expressed a desire to study the problem thoroughly and do what is necessary. With 850 beds, including a well-equipped infirmary, it would seem possible to make a good beginning that will reflect credit on the city and prove an example for other institutions.

Four things will be needed: 1. Provision for gravidae. 2. A well-equipped confinement room. 3. Provision for puerperae. 4. A well-planned nursery, whose equipment should include an incubator.

How many women would take advantage of this sanitarium, or how many could be induced to go there? The greatest difficulty would come from those who would need the care most; that is, from women who already have one or more children at home. If the other children are infected it would be very desirable to have them also in the sanitarium. This would imply a large Children's Department which must therefore be a very important part of the institution.

In the Chicago Policlinic Dispensary of the Municipal Tuberculosis Sanitarium during the last year from November 1, 1911, to November 1, 1912, there have been treated 1,076 cases. It is estimated that about one-third of these cases are women of child-bearing age, or about 350. Among this number there have been ten to fifteen pregnant women. Three of the babies born are known to have died. During the same period there have been in the entire Dispensary Department 8,455 cases. If the same proportion of pregnancies exists in the entire institution, as in the North Side Branch, there have been between 80 and 120 cases of pregnancy. The influence over the patient that is exerted by the physicians and nurses of this institution is so great that it is probable that a majority of these women could be sent to the proposed Obstetrical Department of the hospital. A still greater number would be referred by physicians all over the city.

For the first year it is possible that provision would need to be made for not more than 100 to 150 cases. Counting on a residence of three months this would require only twenty-five to forty beds. I have no doubt that in the course of three years twice this number of beds would be needed.

One of the greatest difficulties in giving proper hospital care to poor women at the time of labor is the fact that they cannot leave their families. If they find a friend who will help them out it will be only

for a few days. Even after a difficult obstetrical operation the puerpera frequently must leave the hospital at the end of a week. This same difficulty will tend to nullify or handicap our best efforts to protect the tuberculous mother. We need an institution to provide temporarily for children who are deprived of the mother's care for a few weeks or months. I believe that we must eventually have one or more children's homes in this city supported by the municipality. Such homes would be very important adjuncts of the tuberculosis hospital and dispensary, but they would also serve for children deprived temporarily of a mother's care because of other diseases than tuberculosis.

The question may be asked why can these patients not be confined in the County Hospital? The Obstetrical Department of the County Hospital is well managed and, as a rule, the attendance during labor is skilful. Most of the patients under consideration would be better off there than at home for the labor. But it is impossible in the large wards of a general hospital or even of an obstetrical hospital to give the tuberculous woman after confinement the care she needs. Moreover, in the puerperal ward of the County Hospital there would be great danger that the tuberculous puerpera would infect the other patients. Likewise it would be impossible to keep the tuberculous patient as long in the County Hospital as would be necessary. A special institution is needed for tuberculous recently delivered mothers the same as for other tuberculous patients.

What has just been said about the County Hospital will apply to the Chicago Lying-In Hospital. This institution is about to build a new hospital which will be of incalculable value to the poor women of the city, but it also cannot provide for the tuberculous women under consideration.

The great prophylactic value of the proposed obstetrical department of the tuberculosis sanitarium in destroying the foci of tuberculous infection can be admitted by all, but thoroughly appreciated only by those intimately connected with the work in the anti-tuberculosis movement. I anticipate the unrestrained support of all such workers to the proposition made tonight. The importance and value of institutional treatment in the management of tuberculosis as a complication of pregnancy and labor has been emphasized by several European writers who have discussed the subject during the last two years. If the entire medical profession and the intelligent laity will give a like loyal support it will help greatly in carrying through the measures that will be needed to establish the institution—not only in this city, but also in the state and nation.

In the meantime we must give the best care possible to these unfortunate women in the absence of institutional help. Even if our highest hopes are fulfilled it probably will be many years before we shall see the great majority of the mothers properly cared for in institutions. Hence we must seriously study how we may improve the home management of these patients.

All patients, poor or well-to-do, should be instructed concerning the special danger of labor and the puerperium, and taught how to make provision for avoiding these dangers as far as possible. They must

arrange for help in the household work for as long a period as they can. At home among the poor it will be practically impossible for the mother to avoid nursing her child. It is indeed questionable whether she should make the attempt unless she has considerable fever and much cough and expectoration. If she herself cares for the baby, washes and dresses it, she will infect it quite as certainly as when she gives it the breast. I would prefer to have the mother relieved from all household work and as much as possible from the care of the baby and give the strength thus saved to the nursing of the child. With proper care in handling the baby, the danger of its infection while nursing is not so very great. Of course, we do not believe that infectious bacilli are in the breast-milk in most cases. If the woman can draw the milk by massage or by pumping, it is better for her to do so. The important thing is that the baby be protected from the mother's sputum and breath. It might be well for her to wear a piece of gauze over her mouth while nursing the child. The important thing for the mother is to avoid fatigue, breathe fresh air day and night and get enough good food and keep from worry.

It is the duty of the physician and nurse to educate the patient. The education or training should begin early in the pregnancy. The rules to be carried out must be stated with great clearness and repeated over and over again. Then she must be watched very carefully to see that she carries out the rules exactly. Here as in many other instances in the practice of medicine, success is achieved only by paying attention to details.

The most important part of the management of these patients must be entrusted to the nurses. It is to this most valuable class of medical practitioners that falls the duty of protecting the patient and all that come in contact with her. It is on the staff of nurses of the tuberculosis dispensary that the community must chiefly rely for its protection against the spread of the tuberculosis infection and in this body of devoted workers rests the hope of an eventual escape from this ancient and present plague of mankind.

EXAMINATION OF EMPLOYEES FOR TUBERCULOSIS*

THEODORE B. SACHS, M.D.
CHICAGO

Systematic examination of employees for tuberculosis leads to the detection of the following classes of cases:

1. "Open" tuberculosis (tubercle bacilli in the sputum). Most of these cases are moderately or far advanced; a small proportion may be just beyond the incipient stages.

2. "Active" tuberculosis, still "closed" (no tubercle bacilli in the sputum); a class of cases varying according to activity and extent of the

* Read at the Fifteenth International Congress on Hygiene and Demography, held at Washington, D. C., Sept. 23 to 28, 1912.

process; chiefly "incipient"; some "advanced." Unless given timely and efficient treatment, a large percentage of these cases pass into Class 1 (become "open," communicable).

3. "Inactive" tuberculosis: signs of a healed lesion; no symptoms of "active" disease. A previous history of "active" tuberculosis or a tuberculous family history can be elicited in a large proportion of these cases.

4. Predisposition to tuberculosis (by malnutrition, anemia or any condition undermining resistance).

METHODS OF SOLUTION APPLICABLE TO EACH CLASS OF CASES AND MEASURES FOR UPBUILDING OF THE ENTIRE WORKING FORCE

It will be seen from the consideration of the above-stated classes of cases, that the tuberculosis problem in a working place presents the following important phases for solution

1. *Detection and Segregation of "Open" Cases of Tuberculosis.*—A large number of these cases in working places without medical supervision remain undetected for months or years, acting as prolific sources of infection. Their elimination from close association with other employees, as well as the immediate institution of hospital, sanatorium, or, if feasible, home treatment, is an imperative step in the interest of those afflicted as well as of the entire working force. Institutional treatment safeguards best the interests of all concerned.

Those with the tuberculous process arrested and working power restored by institutional or home treatment, but still showing tubercle bacilli in the sputum, may be given either suitable outdoor work, or indoor work in hygienic, well ventilated quarters, but not in close contact with other employees. Conscientious, painstaking use of all the necessary precautions on the part of the tuberculous employee is a factor to be considered in the solution of each individual case.

The number of "open" cases of tuberculosis, discovered during the first few months of operation of an efficient system of medical examinations in a working place may be considerably larger than at any subsequent time, and yet the number of "open" cases is small as compared with the entire working force or the second, third and fourth classes of cases above mentioned.

It is *not the number* of "open" cases, but *the possibility of transmission* lurking in each case of this group, through indiscriminate expectoration, that renders control of "open" cases of tuberculosis most important from the standpoint of health of the entire working force. An efficient system of medical examinations in a working place should have, as one of its most important objects, the timely detection and control of these cases.

2. *Sanatorium or Home Treatment of "Closed," "Active" Cases of Tuberculosis.*—As previously stated, cases of "closed," "active" tuberculosis vary considerably, according to the degree of activity and the extent of the tuberculous process. The variation extends from the very slight impairment of the general condition, with little constitutional disturbance and no positive physical signs of pulmonary involvement, to progressive

deterioration of health, with afternoon fever, various symptoms of toxemia and marked physical signs of a progressive lesion.

Cases of the mildest type frequently respond favorably, without discontinuance of work, to a rearranged regime of life, embracing particularly longer hours of night rest, avoidance of overexertion, a more liberal diet and abundance of fresh air. A limited period of sanatorium treatment may be advisable, however, from an educational standpoint, in a proportion of cases even of the mildest type.

As a general rule, temporary discontinuance of work and treatment in a sanatorium are indicated in the majority of "active" cases, and this should be continued in each individual case up to the point of arrest of the tuberculous process and restoration of the working capacity.

Early diagnosis of active cases of tuberculosis is most important from the standpoint of chances of recovery and duration, and, consequently, the expense of treatment.

The earlier the diagnosis, the better are the chances of recovery and the shorter is the period of treatment.

3. *Increase of Resistance of Employees with Signs of Inactive Tuberculosis and of Those Predisposed to the Disease.*—Employees with signs of "closed," "inactive" tuberculosis (Class 3), as well as those "predisposed" to the disease (Class 4: the anemic, poorly nourished, those with frail physique, etc.), may be classed under the general designation of "employees with low resistance." This group forming a considerable proportion of any working force, offers a fruitful field for correction based on thorough investigation of each individual case.

Due consideration should be given in all such cases to the following factors influencing the health of the employee: *first,* the physical fitness of the employee for the given task (degree of exertion involved, position at work, hours, surroundings, etc.); *second,* personal regime: sufficient rest, ventilation of bedroom, nourishing diet, avoidance of harmful conditions and practices, etc. With all these items in the personal life of the employee thoroughly analyzed by the examining physician, considerable improvement of the physical condition of an employee is often possible even with a very slight rearrangement in his daily regime.

The task of the physician is that of a teacher of "right living." Personal instruction given by him to the employee followed by detailed home instruction by the nurse should mark to the employee the stepping stone to better health.

4. *Instruction of the Entire Working Force in the Essentials of "Right Living."*—Noonday or evening talks on "essentials of right living," "prevention of disease" and similar topics given from time to time to the working force, or to its separate groups, tend to the enlightenment of the worker on the essentials of health and its preservation. The interest in matters pertaining to health is rapidly increasing among working people and a physician, speaking on this subject, "to the point" and in simple language, will find in them an appreciative audience.

It is inevitable that the spread of information on maintenance of health among employers and employees is followed by the gradual elimination of conditions in working places which are detrimental to health.

The ultimate result of operation of a system of medical examinations and instruction in a working place is a higher standard of health and efficiency of the working force as well as a stronger bond of understanding between the employer and employees.

EXAMINATION OF EMPLOYEES FOR TUBERCULOSIS A PART OF GENERAL MEDICAL EXAMINATION. TIME OF THE FIRST AND SUBSEQUENT EXAMINATIONS

Examination for tuberculosis should be a part of the general medical examination. An efficient general medical examiner of an industrial concern is fully conversant with the disease. It is desirable, however, that all medical examiners should acquaint themselves with methods of diagnosis and solution practiced in well conducted tuberculosis clinics.

It is apparent that in the interest of all concerned the *first examination should take place at a time of the engagement of the employee.* This is being done at present, with some variations, in a few Chicago concerns. Preliminary information is obtained by means of an application blank including questions pertaining to former and present health of the applicant and his general appearance is scrutinized by the employment manager and nurse assigned to his office. Suspicious cases are submitted to the physician for immediate examination. All other successful applicants are examined during the first week of their employment. The International Harvester Company examines at present all of their applicants for work; Sears, Roebuck & Company are introducing the same.

In other concerns the medical examination of the employees comes with the application for membership in Employees' Benefit Association, which includes a varying proportion of the working force. This is the case with Sears, Roebuck & Co., International Harvester Co., Montgomery Ward & Co., Commonwealth Edison Co., Chicago Telephone Co., Swift & Co., et al. Welfare departments operated by these firms also bring to the attention of the medical examiner a certain proportion of suspicious cases.

The general medical examination of an employee should be *repeated* at certain intervals and also when an employee becomes sick while at work, when the appearance of the employee or certain symptoms suggest the possibility of a gradually developing illness, or on return to work after a period of absence due to illness.

THE CAMPAIGN IN CHICAGO FOR EXAMINATION OF EMPLOYEES FOR TUBERCULOSIS

Eighteen months ago a plan of examination of employees for tuberculosis was submitted to the Chicago Tuberculosis Institute. The plan is described in detail in this paper. To put the plan into operation the Institute appointed a Committee on Factories, which since that time has been conducting a campaign among employers of labor in this city.

The important problem in Chicago, as it would be in any other city, has been to *interest* the employer in the necessity of such examinations. The chief obstacle to the introduction of any system was the lack of information on the part of the employer that there is any such thing as a tuberculosis problem in his place, as well as the lack of appreciation on his part that any benefit can accrue to the firm through the operation of a system of examinations.

In making the appeal to the employers we have placed emphasis on the financial loss sustained by the employer through the imperceptibly growing reduction of working power in the early stages of tuberculosis, the danger to the entire working force from the unknown, uncontrolled "open" cases of the disease, the constant infection of other workers, the subsequent loss of experienced men, the reduction of the general efficiency of the entire working force through the existence of uncontrolled sources of infection, etc. In our campaign we were generally assisted by the humanitarian attitude of the employers toward their workers.

Early in the campaign, a chart was devised which proved of value in the conferences between the Committee on Factories of the Chicago Tuberculosis Institute and the employers whom we were eager to enlist. The chart, as here reproduced, shows in concentric circles the various groups of tuberculosis cases, which you would expect to find in a working place; the size of the circle showing in a general way the relative number of workers included in each group and the degree of shading pointing to the relative importance of the group from the sanitary standpoint.

It was very essential to make it clear to the employer that systematic examination of employees for tuberculosis will disclose not only the "open" and "active" cases of tuberculosis the solution of the majority of which lies in institutional treatment, but also the larger group of workers in whom a predisposition exists either because of latent infection or because of malnutrition, anemia, etc. One of the important objects of the examinations, the employer was told, is to raise the resistance of these groups through proper medical advice, education in right living, change in occupation if necessary, etc. By the spread of this education in "right living" among the employees, the final result is a "higher standard of health and efficiency of the entire working force."

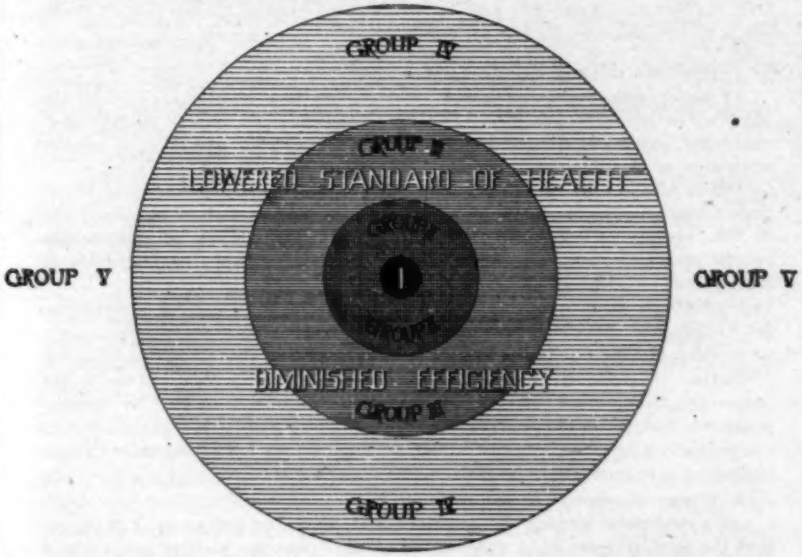
As the result of a campaign conducted by the Committee on Factories of the Chicago Tuberculosis Institute during the last eighteen months, systematic examination of employees for tuberculosis is at present in operation in the shops of the International Harvester Co., Montgomery Ward & Co., Chicago Telephone Co. and Swift & Co. Sears, Roebuck & Co. have for some time past paid special attention to tuberculosis as a part of the general examination.

The physicians connected with the above and other concerns meet with the Committee on Factories of the Institute from time to time to discuss the important phases of their work, and these meetings are very important in the gradual formulation of principles and practices. At the four conferences so far held, the subjects chosen for discussion were: "The Best Method of Campaigning for the Extension of the Examina-

The TUBERCULOSIS PROBLEM IN A WORKING PLACE

by Theodore B. Sachs

GROUPS OF WORKERS



CONDITION			REMEDY
GROUP I	Tuberculous.	"Open"-Communicable Cases.	Periodic Medical Examinations
GROUP II	Tuberculous	Disease-Active, Progressive.	Right Conditions for Entire Working Force.
GROUP III	Tuberculous.	Disease-Inactive.	Education of All in Right Living.
GROUP IV		Workers With Low Resistance.	Hospital & Sanatorium Treatment for Groups I, II & part of III.
GROUP V		Workers in Average Health.	

RESULT

HIGHER STANDARD of HEALTH AND EFFICIENCY

For Copies of This Poster Apply to the Committee on Factories of The Chicago Tuberculosis Institute

tion of Employees to Other Concerns," "The Time of the first Examination of the Employees," "When Should the Examination be Repeated," "What Should the Examination Consist of," etc.

At the next meeting representatives of the above firms as well as of the large department stores and their physicians, will meet with the Committee of the Institute to further discuss the various features of the problem.

The prospects are for the gradual introduction of the principle of medical examinations into an increasing number of concerns.

THE CAMPAIGN IN CHICAGO FOR EXAMINATION OF EMPLOYEES TUBERCULOSIS

The details of the plan submitted to the Chicago Tuberculosis Institute eighteen months ago and since then advocated under the auspices of its Committee on Factories is as follows:

1. *Physician to examine all suspicious cases.*

In places with established medical service, this task may be assigned to the physician on the staff of the firm. In large establishments a special "tuberculosis" examining physician may be necessary. In either case, possession of special experience in the diagnosis of tuberculosis is very important.

Duties of the physician: examination and diagnosis of cases; disposition of those found tuberculous; instruction of the sick in the essentials of treatment and of the "predisposed" in right living and in measures tending to increase the general resistance; frequent noon or evening talks to the entire working force on maintenance of health and prevention of disease.

Cooperation with the family physician of the employee in all cases in which the family physician prefers to retain control of the case.

2. *Trained Nurse to assist the physician.*

Duties: to assist the physician during examinations; to visit and study the homes and living conditions of employees pronounced "tuberculous" or "predisposed;" to instruct in the fundamentals of right living and in the methods of care and prevention by actual demonstration in the employee's home; to gather in each individual case information essential to its right solution.

3. *Classes of cases to be examined.*

At a conference between the superintendent, physician and nurse it is agreed that the employees are to be watched for certain symptoms possibly indicative of tuberculous infection. A list of these symptoms is given in a card prepared for the guidance of superintendents and foremen, which is printed in full below:

DIRECTIONS TO FOREMEN OR OTHERS IN CHARGE OF EMPLOYEES

TUBERCULOSIS IS CURABLE—IF DISCOVERED EARLY

PLEASE THEREFORE WATCH FOR THE FOLLOWING GROUPS OF CASES:

1. Employees below weight, weak or anemic.

2. Employees whose working power seems on the wane, without apparent cause.

3. Employees from houses where death from tuberculosis occurred, or where a case of tuberculosis exists, or employees who have been previously treated for tuberculosis.

4. Employees who have the following, due frequently to tuberculosis:
   (1) Gradual loss of weight and strength.
   (2) Fever in afternoon (even though slight).
   (3) A lasting cough or cold.
   (4) Loss of appetite.
   (5) Hoarseness, continued or recurring.
   (6) Night sweats.
   (7) Spitting blood.
   (8) Tired all the time.

Committee on Factories of
The Chicago Tuberculosis Institute,
1351 Otis Building, Chicago

4. Examination.

With the compilation of a list of suspicious cases, all such cases are submitted to thorough medical examination.

Each individual case is classified, (a) according to diagnosis: "tuberculous" or "non-tuberculous," "active" or "non-active," "open" or "closed;" (b) according to necessity of change of occupation or discontinuance of work; (c) according to need of hospital, sanatorium or home treatment.

The solution of each case is considered after a full analysis of all its medical and social aspects.

5. Supervision of various groups of cases.

Close supervision is maintained over (a) employees classed as "predisposed;" (b) employees returned to work, with disease "apparently cured" or "arrested" by institutional or home treatment; (c) employees taking "home treatment" under the direction of the company's physician.

The above described arrangement aims at continuous watch of health of employees engaged after (or without) a preliminary medical examination. The plan resolves itself finally into (1) medical examination of applicants for work, and (2) supervision of health of employees while at work.

CONCLUSIONS

Very important consideration prompted the campaign in Chicago for the introduction of systematic examination of employees for tuberculosis: *first*, the realization that *early* diagnosis of tuberculosis can be best attained with a system of examinations of working people, that will detect the disease long before the pronounced symptoms manifest themselves, detected while they are at work frequently unsuspecting the presence of any disease; *second*, the operation of a system of examinations in a working place and the knowledge of the existing conditions gained thereby eventually leads to the improvement of sanitary conditions and enlists the support by the employer of adequate and efficient institutional provision for the treatment of tuberculosis; *third*, the further realization on the part of the workers, employers and the community at large of the present utter helplessness of a worker in the case of illness will lead to more comprehensive measures for the protection of the worker and his family, in the case of his illness (further extension of the principle of the employees' benefit associations, workingmen's insurance, etc.).

Experience in anti-tuberculosis work in a community teaches us that support of any element in the community can be permanently gained by

a clear demonstration of the relation of that element to the existing problem, and this is becoming apparent in our present campaign in Chicago.

Those who wish to get further details of the plan in operation may write to the Chicago Tuberculosis Institute, Otis Building, Chicago.

To summarize: the aim of the described plan of examination of employees for tuberculosis is, *first*, detection and suppression of sources of infection in working places; *second*, detection of cases of the disease in the curable stages; *third*, guidance of all employees predisposed to the disease and of those who are re-employed after having recovered their health by sanatorium or home treatment; *fourth*, guidance of all employees in right living and methods of prevention; *fifth*, elimination, with the spread of information, of conditions undermining the health of employees.

THE USE OF TUBERCULIN IN DIAGNOSIS AND TREATMENT *

WALTER H. BUHLIG, S.B., M.D.
CHICAGO

There are four tuberculins commonly employed. These are (1) the old tuberculin of Koch; (2) Koch's new tuberculin or the T.R.; (3) the bacillus emulsion, or B.E., and (4) the bouillon filtrate, or B.F. To give an idea of these various tuberculins, I might state briefly the composition of them. Koch's old tuberculin is the filtrate of a glycerin bouillon culture of the tubercle bacillus after boiling, usually in a partial vacuum, to about 1/10 of its original volume. One cubic centimeter of this is usually considered as 1 gram. In the preparation of Koch's new tuberculin living bacilli are taken from a bouillon culture, dried, finely powdered by grinding for a long time and then thrown into physiologic salt solution. That which does not go into solution at first is the T.R., or the residue, and this is later incorporated into an emulsion in salt solution with a small amount of glycerin by further tritration. Here the quantity in grams in any given volume can be accurately weighed. The soluble part that is discarded in the making of this tuberculin is often called T.O., or "die obere tuberculine." The bacillus emulsion is an emulsion of finely ground tubercle bacilli and is practically a combination of the T.R. and of this rejected T.O. with 50 per cent. of glycerin. Most manufacturers, to insure the death of the tubercle bacilli, heat the B.E. at about 60 C. The bouillon filtrate is a simple filtrate of a glycerin bouillon culture of the tubercle bacillus without any heating.

It will be seen, therefore, that each tuberculin has properties somewhat different from the others. In the old tuberculin, the heating modifies, perhaps destroys, some of the toxic principles, and concentrates others not so changed. In the bouillon filtrate there is no heating and

* Read at the meeting of the Englewood Branch of the Chicago Medical Society, Nov. 12, 1912.

no concentration. It will be noted that in the B.F. only the extra cellular soluble products of the growing bacilli are employed. In the old tuberculin there are extra cellular products and whatever is derived from the bacilli by heating. The T.R. contains the insoluble products of the bacillus itself, and the B.E. contains these and those substances of the body of the bacilli which go into solution in physiologic salt solution.

For the purpose of diagnosis, only the old tuberculin in various modifications is used. Perhaps the only reliable method in the adult is the subcutaneous injection of Koch's old tuberculin. In such a case the temperature and pulse every two or three hours for at least twenty-four hours before the injection must be known and for forty-eight hours after the injection, the patient taking a minimum of exercise during this period. Two mg. is a medium safe dose for a person weighing about 130 pounds. Smaller doses at the start and increasing at four-to-five-day intervals, may be employed in a patient under proper control. I consider more than 4 mg. for diagnosis an unsafe dose. A reaction is considered positive in twenty-four to forty-eight hours when there are present a general reaction, a local reaction and a focal reaction—all three. The general reaction is adjudged as present when the temperature is clearly a degree about the previous controls, and when the pulse is 10 or more beats faster. When the patient's temperature before the injection is high, or very irregular, such a tuberculin test should not be made because it can not be interpreted, and it might be stated here that much advanced cases may show no response. The local reaction consists of a red, swollen, tender area about 1 inch or more in diameter at the point of injection. By focal reaction is meant increased symptoms and physical signs at the site of the tuberculosis.

The von Pirquet test is made by scarifying two small areas on the arm after washing with ether and inoculating this area with a drop of the old tuberculin undiluted or better in a 20 per cent. strength, always using a third or control scarification with distilled water or salt solution. A reddened papule about a centimeter in diameter and coming on within twenty-four hours is considered a positive result. This method is of value only in children and particularly in those under the school age. In adults it should not be depended on for the reason that too many normal people react positively.

The Moro test is based on the same principles. Here the tuberculin is incorporated with equal parts of lanolin and a small portion is rubbed into the skin of the abdomen, with redness, vesicles and marked itching in twenty-four hours. I have had little experience with the Moro test, but should make the indications for its use those of the von Pirquet.

The ophthalmotuberculin reaction may be mentioned only to condemn it. I believe that hardly anybody uses it now. The old tuberculin is precipitated with alcohol and the residue redissolved in physiologic salt solution. One drop of a 1 per cent. or .5 per cent. solution is put on the conjunctiva of one eye, the other eye being used as a control. I have made a good many of these tests, and had no serious results. But I am convinced that the eye is too important an organ to take chances with, and in a little experiment done soon after Calmette announced this

method of diagnosing tuberculosis, I assured myself that positive reactions could be obtained in non-tuberculous cases that ran a temperature from other causes. A probable explanation of many of the serious results obtained by this method is on the anaphylaxis theory; that is, one doctor puts this tuberculin into the eye of a patient with a negative result but sensitizing the conjunctiva. Later a second doctor, not knowing of the first test, puts the tuberculin into the same eye with a bad result.

In the treatment of tuberculosis, different men use different tuberculins. I am reluctant to use any tuberculin that is constructed out of living tubercle bacilli, and consequently I rarely now ever use the T.R. The B.E. has this objection that it often causes painful infiltrations or suppuration at the point of injection. The ideal tuberculin, one containing all of the toxic properties, would seem to be a combination of the B.E. and one of the filtered tuberculins. Whatever product is chosen, the principles of the administration of all of the tuberculins are practically the same, and can be expressed briefly like this:

Begin with a small, an absurdly small, dose, say 1/50,000 mg., or even less; the earliest doses of all the tuberculins are practically the same; increase slowly, but constantly, at intervals of four to five days; the amounts of tuberculin finally given vary a good deal, up to 10 mg. and with some tuberculins, even much more; try never to get a distinct increase in temperature or any local or focal reaction; if a reaction is the result diminish the next dose; reduce the exercise of the patient for at least twenty-four hours after the injection, and insist on rest in bed if the temperature rises a degree or more from the tuberculin; when using a new dilution or when starting a different tuberculin, always give a little less than the former dose; it is wise to use more than one tuberculin in the treatment of any case; have the dilutions made up about every two weeks or less; above all, be sure your case is one suitable for the administration of tuberculin; and do not expect tuberculin, which is only an adjuvant, to remove the necessity for fresh air, rest and proper feeding.

Treatment with tuberculin is mainly by subcutaneous injection. I have had no experience with inunctions, mouth treatment or intravenous injections. I use practically only human tuberculins. I begin ordinarily with the bouillon filtrate, and increase this until I am giving about a half of a milligram. Then I follow along with old tuberculin and run this up in adults to 3, 4 or more milligrams. If I believe I am not getting good results, I stop the one I am using at a lower point, and begin on the B.E. I rarely give B.E. for a long time, but switch back to B.F., and end up on the old tuberculin. Such a course of treatment requires about seven or eight months, giving three doses in two weeks, and I tell my patient that if such a course can not be persisted in, it is wisest not to begin treatment. If I get a reaction, which I try always to avoid, I drop back with whatever tuberculin I am using to the dose which I know from my records will not give the reaction and then increase more slowly. The patient takes and records two afternoon temperatures every day while he is under observation and notes his weight each week.

The indications for the use of tuberculin can best be learned by enumerating the contra-indications. No one of course can make rules

regarding contra-indications which must always hold. There are always present the personal equation of the patient, the general conditions surrounding the patient, and the experience of the physician, but I am convinced that the following suggestions are, in the main, correct. I never give a patient tuberculin if I am assured that there is a rapid loss of weight. Such a patient I should first put to bed and watch carefully until the weight is more or less stationary. I consider a case with recent severe hemorrhages an improper one for tuberculin. I do not believe that patients with afternoon temperatures of over 100 F. should have tuberculin, and when there is a very low morning temperature, say 96 F., with slight afternoon rise in a known case of tuberculosis, this variation, and particularly the low morning temperature, should cause honest deliberation. I know that tuberculin often brings down high temperatures, but I believe the administration is subjecting the patient to considerable risk, and if undertaken at all, it should be with great care and with the smallest of doses. I will not at the outset give tuberculin when there is an advanced lesion, or where there are extensive or multiple lesions. Such patients should by the usual other measures show some improvement before tuberculin is administered. Some cases of glandular tuberculosis may be exceptions here. Acute cases are not proper subjects for tuberculin and the same may be said of patients with nephritis. With all other conditions good, I am not so fearful of a rapid pulse, provided it is not much over 100 F. I consider the diazo reaction in the urine a bad prognostic sign, and when this is present I believe tuberculin should be withheld. Tuberculin should be looked on as a very powerful poison, capable of harm if carelessly used. Its use in treatment is for the purpose of actively immunizing the patient, and where advanced or multiple lesions are present, the patient is already being auto-inoculated.

The advantages of tuberculin, always assuming that it is used with other acknowledged methods of treating, are (1) that the recovery of a patient with tuberculin is more rapid than without; (2) the healing of a small focus can be made more certain by adding tuberculin than by other treatment alone; (3) patients are more certain of escaping complications and febrile attacks; and (4) the immunity of the recovered patient is far greater when tuberculin has been administered, making relapses less frequent.

31 North State Street.

INHALATION TREATMENT: A NEW APPARATUS*

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From the time of Hippocrates to the present, apparatus has been devised for human inhalation.

Infusions of aromatic herbs, balsamic vapors, chlorin, iodin, turpentine, muriate of ammonia, the steam of escaping sulphur springs, the air of salt mines, and the air of stables containing cattle, have been advocated.

* Read before the Chicago Medical Society, Nov. 6, 1912.

Inhalation includes (1) thermotherapy, because the inhaled vapors are warmer than ordinary air; (2) hydrotherapy, because water vapors are inhaled; (3) respiratory gymnastics, because the patient has to breathe deeply; (4) medicinal therapy when medicated vapors are used.

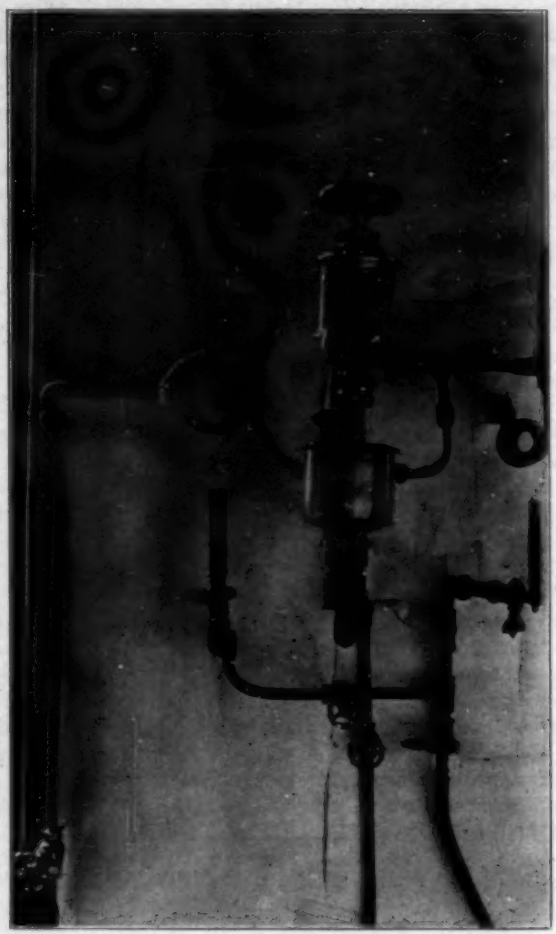

Figure 1.—Compressed air sterilizer and gauge.

As a result of inhalation of heated vapor, an active hyperemia of the mucous membrane takes place, and as a result an increased activity of the glands. This increased secretion of fluid helps to remove the tenacious secretion already present, and possibly it also has a chemical effect on the pathologic products. The deep breathing also helps to remove the secretion. This effect is greater the deeper the breathing. We can

instruct the patient to inspire slowly and expire quickly. In this way the inspiration takes place under lower pressure, so that during inspiration there is a slight venous stasis in the thorax—a sort of passive hyperemia. The medicines act by direct contact, disinfecting the pathologic

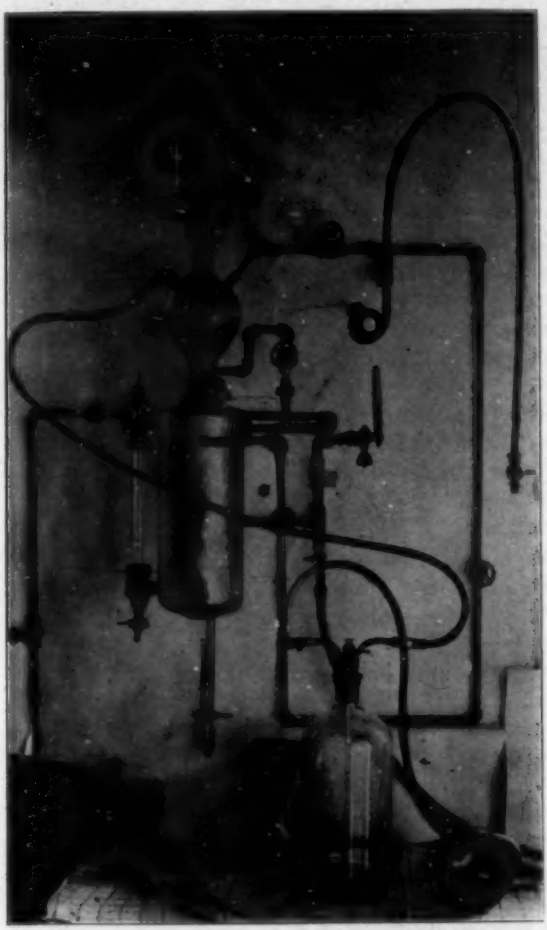

Figure 2.—Apparatus No. 1.

secretions and stimulating the diseased mucous membrane; moreover, they are absorbed and distributed to various parts of the body where they exercise a therapeutic effect. They are combined with CO_2 and given off, sometimes changed and sometimes unchanged. They penetrate to the diseased alveoli, so that they come in contact with the entire affected membrane and its secretions. Care should be taken not to use too con-

centrated vapors, for they may cause nausea and other unpleasant effects. The concentration must be constant throughout the inhalation.

EXPERIMENT 8.[1]—Subject male, aged 40 years. Pole; place, Cook County Hospital; disease, secondary anemia and septicemia following suppurating tonsillitis. Vapor used, lanolin slightly flavored with oil of

Figure 3.—Apparatus No. 2. Perfected.

gaultheria; time of inhalation, twenty minutes. The respiratory movements were very complete with unusually deep forced inspiration and almost normal expiration. All of the accessory respiratory muscles were

1. Jour. A. M. A., May 28, 1898.

brought into play during the period of inhalation. Previous to the vaporization the lungs of the patient were examined and found normal.

Soon after death a post-mortem was made. A small section was cut from the lower lobe of the left lung and placed on a freezing microtome. When ready, sections were made and placed under a high objective. They revealed oil globules in the alveoli. Another section of the lung from the lower left lobe was put in osmic acid the following morning and allowed to remain seventy-two hours. Sections were then made by a freezing microtome. They showed well stained oil globules within the alveoli. This I believe to be the first time a demonstration of a vaporized medicament penetrating into the pulmonary alveoli of a human lung has been made.

Inhalation therapy, either by nebulae or volatilization, is not a curative measure. It sustains the rôle of a topical benefit when associated with other methods of treatment. I believe it effective in influencing diseases of the respiratory passages, by modifying various symptoms. The tendency of atomized and nebulized medicine is to condense near the point of inhalation. By use of the new apparatus this factor is largely eliminated. There is a greater amount of heated medicament deposited on the respiratory surfaces. I believe the higher temperature carries the drugs used in greater quantity into the pulmonary alveoli. Within these limitations there is every good reason for its use.

I have proved by animal and human experimentation that medicated vapors penetrate to the alveoli. They should be used at a definite dosage and at a definite temperature. For dry laryngitis and pharyngitis menthol is valuable. In acute bronchitis with abundant thin secretion, turpentine and eucalyptus; in chronic bronchial catarrh, balsam Peru with menthol; for purulent bronchitis and bronchiectasis, lignosulphite.

In conclusion, the following benefits seem to me established as a reason for the general use of antiseptic nebulae in the treatment of the respiratory tract:

1. The respiratory capacity is increased.

2. The catarrhal condition of the air passages is diminished, thereby aiding a better introduction of air into the lungs.

3. The pulmonary passages are kept in an aseptic condition and the danger of new bacillary invasion minimized.

4. The marked relief of cough and dyspnea.

5. The alimentary tract is undisturbed by drugs, giving ample opportunity for the increase of vital resistance by suitable diet and constitutional treatment.

6. The treatment by the inhalation of antiseptic nebulae is rational and practical.

7. The new apparatus safely combines steam, sterilized compressed air and definite drug medication for treatment of the respiratory passages.

DISCUSSION

Dr. P. J. H. Farrell: Some fifteen or sixteen years ago I was much interested in the inhalation method of treatment. I tried many devices without success. The apparatus devised by Dr. Thomas is ingenious and useful. The difficulty I have always found is to have a continuous and uniform temperature with the antiseptic agent used. This factor he has undoubtedly overcome. Of course, the next question that arises is, to what extent will we get the antiseptic action on the tissues with this apparatus in excess of what we get by painting the pharynx. This device has opened up the whole field of inhalation therapy. Inhalation has been used with success since the dawn of medicine. The apparatus perfected by Dr. Thomas is far superior to the methods hitherto used and results by its use will be correspondingly better.

Dr. E. Pynchon: I have been employing nebulae for inhalation for several years and can speak favorably of the efficiency of such practice. The apparatus which I have employed was made for me by Truax, Greene and Co., several years ago. The bottle has a capacity of only two ounces and is provided with a flattened tip which the patient holds between the teeth. It has outside of that an enlargement like a washer. The patient closes the lips tightly on the tip, when the washer closes the mouth sufficiently so that the patient can get the benefit of inhalation with the air pressure employed. At the start the patient cannot stand as much air pressure as later. It is about twelve pounds at first and later twenty pounds.

I have him inhale two or three times, the lungs being filled to the utmost capacity. The lips serve as a safety valve to prevent the possibility of any injury from the pressure of the compressed air. I have not used this apparatus for the treatment of pulmonary tuberculosis, but only for the acute or catarrhal bronchitis so often associated with diseased conditions of the nose. Prior to the use of the nebulae, I have frequently had the patient inhale from the ordinary atomizer a little spray of eucalyptus or menthol. I have always had beneficial results from such practice.

Dr. Major H. Worthington: I have been interested in watching the development of this new apparatus, and the doctor is to be congratulated on the results he has obtained thus far. The treatment of respiratory diseases by medicated steam is not a new one, though it has been discarded to a great extent because of the fact that we were unable to control the temperature of the steam and regulate the amount of medicine the patient breathes without discomfort to him. Dr. Thomas has accomplished these two things with his apparatus. It has been proven that steam impregnated with medicine does not dilute the medicine used, to any appreciable extent, also that steam can be carried deeper into the lungs than the medicament could if lower than the body temperature. In addition to the experiments Dr. Thomas reports:

Demarquay, by the use of an inhalation of perchlorid of iron for which he afterward tested with cyanid of potassium, was able to show the presence of the inhalation in the vesicles of the lungs as Lewin also did in a lung cavity.

I think that Dr. Thomas' apparatus is quite a step in advance in the work done along this line, and I believe we will be able to get some good results from it as an adjunct in the treatment of respiratory diseases.

Dr. Thomas, closing: The next problem will be to work out the automatic control of the heat. We have too great a pressure of steam, and must too speedily reduce it with the compressed air and get too great a condensation. I hope I can get some automatic device, as on a water heater, and have the gas flame lowered or raised as demanded to secure an even and equable temperature. If we can do this, the effectiveness of the apparatus will be greatly improved, but it must always take a secondary position to general treatment. This apparatus is to be used only in the ambulatory cases.

BRONCHIAL ASTHMA *

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The term bronchial asthma, though in common use, seems unnecessary in so much as all asthmatic attacks consist essentially of bronchial manifestations of which the dyspnea is mainly a result, and even this has distinctive differences from other types of respiratory ataxia, which are a feature of the so-called symptomatic forms of asthma, such as cardiac or renal asthma. I use the term bronchial asthma in the present instance chiefly to identify the type of asthma whose treatment I wish to discuss from other types more evidently of reflex origin, in the sense that in the bronchial form there are conditions of the bronchial wall and mucosa which are an abiding factor in the induction and maintenance of the attack.

Asthma has the unique distinction of being a disease with no definite etiology, which may account for the fact that it was late in the history of medicine before it was accorded recognition as a distinct affection, though the modern theory that asthma is a neurosis is but a more complete elaboration of views held by a few observers over three hundred years ago.

Celsus used the term asthma to indicate a severe difficulty of breathing, dyspnea representing one, and orthopnea the other extreme of respiratory distress. Aretaeus applied the term asthma to states of orthopnea, while Galen discarded the term entirely. Van Helmont and Willis, in the seventeenth century, classified asthma as a distinct affection, the former calling it asthma spasmodicum. Darwin speaks of a convulsive type of asthma of epileptiform character and reflex origin, a forecast of the present views of West, Hutchinson, and others.

The nervous theory of asthma became lost about the beginning of the last century in the belief that asthma was merely symptomatic of other conditions, and the light thrown on accompanying lung conditions through the development of auscultation by Laennec naturally led farther away from the nervous theory for a time, Louis and others absolutely denying nervous causation for asthma. Rokitansky attributed asthma to the presence of emphysema, while Laennec himself emphasized the etiologic force of his *catarrhe sec.*

Ramadge, in 1835, believed the attack of asthma to be due to spasm of the bronchial tubes, a theory which originated with Floyer long before, and was adopted by Cullen and Laennec. Romberg also adopted this theory because of the discovery of muscle tissue in the bronchial wall by Riesseisen.

Since 1850 asthma has been regarded as an independent disease, and the direction of investigation has been toward explaining the cause of the spasm.

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* Read before the Chicago Medical Society, Nov. 13, 1912.

The controversy over the ability of the bronchial tubes to contract, which continued some twenty years, developed the theory of Wintrich and Bamberger of spasm of the diaphragm and other respiratory muscles. Traube supported the theory of diaphragmatic spasm, while Budd, Jaccoud and Germain See placed stress on spasm of the other inspiratory muscles.

About 1870 the experiments of Paul Bert led to a strong revival of the theory of bronchial spasm, but the difficulty of explaining all the symptoms of the attack on this ground led to the theory of Weber, that changes in the bronchial mucous membrane of vasomotor origin were to blame. This theory was adopted in part by Riegel.

In 1887 Germain See maintained that asthma was a neurosis of the respiratory center in the medulla resulting in spasm of the respiratory muscles and rigidity of the diaphragm. Experiments by Riegel and Edinger supported this view. Hughlings Jackson maintained that asthma is a respiratory convulsion of medullary origin. The influence of neurotic factors in the production of asthmatic attacks has even led to the theory that asthma is the manifestation of a psychosis.

Auer and Lewis claim that acute anaphylactic death may be due to stenosis of the bronchi from contraction of muscle fibers due to influences of peripheral rather than central origin. Gillette reported (to February, 1909) fifteen fatal cases from the use of horse serum, also thirteen severe general reactions. Of these eighteen had a history of asthmatic attacks, and nine of them died. In several of these subjects there was the history of asthmatic attacks brought on by proximity to horses.

Barach, of Pittsburgh, suggests that asthma may be due to conditions of anaphylactic origin, the introduction into the body of a strange protein to which the body is not immune; and Meltzer asks why we may not assume that asthmatics are individuals who are sensitized to a definite protein substance and that the asthmatic attack takes place when the same protein invades the body in the same manner.

Weaver suggests that sensitization can be produced in the omniverous animal man by foods. If anaphylactin were demonstrated in the blood of an asthmatic, and animal experimentation was positive instead of negative so far, we would have to look on this as other than mere theory.

In the effort to fasten the cause of asthmatic attacks on the local bronchial conditions we may refer to Leyden's crystals, Curschmann's spirals and "bronchiolitis exudativa," Schmidthorn's spasm of the pulmonary arteries and Clark's transitory edema of the bronchial mucous membrane, likened to angioneurotic edema. All of these are insufficient, and may be at best but contributory causes. Crystals and spirals are at present considered, like eosinophilia, as mainly of diagnostic importance.

Since the introduction of the fluoroscope we have learned that limitation of diaphragmatic excursion has much less influence in the production of asthmatic dyspnea than Wintrich and his followers supposed.

Gibson states that typical asthmatic paroxysm can be produced experimentally through the action of muscarin, and that these attacks can be relieved by such sedatives as atropin, belladonna, morphin, or opium.

Aufrect has shown that the musculature of the bronchioles consists of a strong circular layer and a weaker longitudinal layer. He assumes that an asthmatic spasm occurring in subjects with normal bronchial mucous membrane can be explained by reflex spasm of the circular muscles of the bronchioles which overcomes the normal force of the longitudinal layer. In those cases marked by catarrh of the bronchi the longitudinal layer of muscle suffers more from the inflammatory state than the circular layer, and the spasm is more due to relative overaction of the latter than to reflex spasm.

Fraenkel, whose views have caused much discussion in Europe relative to asthma, believes with Curschmann in both neurotic and inflammatory causes for the spasm, while he agrees with Biermer that all the characteristics of an asthmatic attack may be produced by bronchial muscle spasm, yet animal experimentation cannot uphold this as a sole cause for asthma in man because we cannot demonstrate a purely spastic attack in man, there being always some alteration in the bronchial mucous membrane. These bronchial changes may be sufficient in themselves to account for all the symptoms of the attack, but in view of the fact that they are not suddenly acquired, they do not suffice alone to explain either the precipitation of spasm or the exacerbation of a continuous dyspnea. Therefore we must invoke the influence of a neurosis.

That asthmatic attacks may be brought about by reflex impressions from almost any organized tissue of the body is amply proved by a superabundance of clinical material. The rhinologic tract has furnished a riotous confusion of cases in support of this fact.

Psychic trauma is, at times, apparently a factor in the precipitation of attacks of asthma, though Hoffman of Leipsic says that such an argument is used when "words are needed and knowledge is lacking." Nevertheless, the connection of shock, fright, or emotional excitement with the appearance of an asthmatic attack is difficult to disprove in occasional instances.

In individuals who have either an hereditary or acquired neurosis predisposing to asthmatic attacks, it may be impossible to demonstrate any bronchial factor before or after a paroxysm, but I believe such is always present; at least, I have never observed an attack that I believed could be classed as purely spastic in nature.

While I believe that asthma is essentially a neurosis, and that reflex influences from other territory than the bronchi are frequent factors in the precipitation of attacks, it is also my experience that the bronchial factors of congestion, swelling of the mucosa, secretion, and spasm are present in the majority of cases and account for the principal symptoms accompanying the spasm. In the majority of instances evidences of these conditions can be made out immediately before as well as after an attack even if the interval be not marked by signs of bronchiolitis. It is this class of cases that furnishes my excuse for using the term bronchial asthma.

The upper air passages with their highly vascular, erectile tissues for the purpose of warming air and arresting foreign matter; the large

bronchial tubes with rigid walls containing little muscle tissue; the small bronchi with relatively large amount of muscular tissue, contracting readily, possibly, as Watson Williams suggests, rhythmically with the nose, throat and larnyx, and containing no cilia in the smallest tubes, which, as Grainger Stewart remarks, may explain why capillary bronchitis is more severe than inflammation of the larger tubes, furnish an association of mechanical conditions which, connected with the elaborate peripheral and central nervous mechanism formed by the central respiratory centers, efferent and afferent tracts, all under the control of the higher centers, and connected through centripetal tracts with, probably, every sensory nerve of the body, also with efferent tracts almost as widespread, which tracts involve, according to Gibson, the fifth, seventh, ninth, tenth, eleventh and twelfth cranial and spinal nerves; connecting these with certain nerves in the bronchial tubes which Brodie and Dixon have shown to have ability to dilate or contract these tubes, we have an associated mechanical and nervous mechanism which accounts for the production of the asthmatic spasm, however varied and extensive the individual etiologic factors may be in specific instances.

Whatever explanation we may place on the essential nature of asthma —peripheral, central, locally bronchial, physical, anaphylactic, or what not—we still have to face the above factors in the production of the spasm, and deal with them in our treatment of the same.

I will make no effort to cover the subject of the general treatment of asthma. It would involve much useless reiteration of familiar and speculative therapeutics. I wish, however, to speak of that numerous class of cases in which conditions in the air tract are responsible for the institution of the spasm as well as for the symptoms it presents.

Wilson, of Birmingham, suggests that the spasm of asthma may be compensatory to changes in the bronchial mucous membrane which interfere with ciliary action, and, therefore, may be of value to the patient. I am afraid the patient would be the last one to accept this reasoning and modify his demand for immediate relief.

The treatment of the attack depends, of course, on its severity. If very severe we are obliged to use such drugs as morphin, heroin, adrenalin, pyridin, chloroform, ether, or chloral. Morphin is in every respect the most useful of these, especially in elderly people with heart muscle of doubtful integrity. I believe it acts best when given without atropin. Adrenalin is very satisfactory in many instances. It should be given hypodermically. However, in those cases where chronic bronchial catarrh is present, the secondary effect of adrenalin is often very unpleasant, and the patient is made worse by the relaxation and swelling of the mucous membrane which follows its use. The inhalation of pyridin is often useful, and was preferred by See to morphin. In my experience it has not been satisfactory in cases with associated bronchial changes.

When the attack is not severe enough to demand the immediate relief afforded by the above drugs we may employ milder sedatives and antispasmodics such as stramonium, lobelia, belladonna, amyl nitrite, pilocarpin, nitroglycerin, and, if the heart is strong, ethyl iodid, the various

burning powders and sprays, which, to be effective, must contain cocain. Sprays are usually effective only in cases having irritation in the upper respiratory tract. Burning powders contain either stramonium, belladonna, lobelia, tobacco, opium, or a combination of these substances with nitre. They are useful in almost any type of asthma, and very effective in some instances.

The management of a case of asthma involves careful attention to the patient's manner of life, general hygiene, diet and climatic surroundings. Saundby, of Birmingham, naively remarks that if the cause can be found treatment is satisfactory, otherwise it is not.

The fact that in a certain percentage of cases the inciting factor in the attacks is an irritable focus in the nasal passages has led to very much unnecessary interference with this region. Rhinologic operations are often necessary and sometimes very effective, but there is, with the exception of gastro-enterostomy, probably no surgical field in which so much unnecessary operating has been done. Francis, of London, says that any vagal or sympathetic irritation may, under proper conditions, cause asthmatic reflex, and that the nose has a comparatively small share as a cause.

Brugelmann has called attention to other asthmogenous zones in the pharynx, tonsil and trachea. Local treatment of disturbances of these regions may prevent or relieve asthmatic attacks.

The endobronchial treatment of asthma has been tried with some success. On account of the spasm of the tubes it is difficult to introduce remedies suspended in the ordinary oil sprays. The direct injection of medicaments into the trachea, via the larynx, with the help of local or general anesthesia, has been used with more or less success. Freudenthal, of New York, reports favorably on this method. He injected from fifteen to twenty drops of adrenalin solution, or from five to ten drops of an emulsion of orthoform through a tube after using cocain to overcome obstruction. He attributes the results to the very free secretion expelled during treatment and afterward. The treatments were given weekly for a period of two months.

Ephrahim reports some fifty odd cases of which nearly 50 per cent. were cured by a single endobronchial treatment. Very definite details of the nature of these cases would be necessary before we could form any conclusions as to the value of this method in ordinary bronchial asthma.

The trouble with any remedy introduced by either spray or tubes into the trachea is the difficulty of reaching the smaller bronchial tubes. Even if spasm of the tubes is a minor feature, the irregularities in the lumen of the tubes, which are often blocked with extremely viscid mucus, will be sufficient to interfere with the successful application of remedies through the trachea. Sedatives and antispasmodics may relieve an asthmatic spasm, or even mitigate a continuous dyspneic type of asthma, but they accomplish practically nothing in relief of the local state of the smaller bronchial tubes, which is often the main reason for the permanency of the asthmatic state. The difficulty of treatment is further added to by the presence of emphysematous conditions and circulatory weaknesses.

Climate, diet and general hygiene have an important relation to the general management of this class of asthmatic subjects. Special diet lists have been devised, but must be modified to suit individual cases. Gastro-intestinal irregularities have a distinct bearing on the frequency and duration of asthmatic spasms, but the chief therapeutic indication is relief of the bronchial catarrh, for as long as this persists the recurrence of an attack is only a matter of the appearance of some of the many spasm-producing factors which in the absence of local bronchial changes are not sufficient to induce an attack.

If we refer to the topography of bronchitis in non-asthmatic subjects, we remember that while bronchitis of the larger tubes is amenable to the stimulating expectorants, such as ammonia preparations, these remedies have little or no effect when the smallest tubes are alone involved. In the latter case the best effects are obtained from remedies which are slowly eliminated by the bronchial mucous membrane, and have an alterative action on the secretory structures of this tissue. It is because it has peculiar virtue in this respect that iodin has obtained a universal reputation in the treatment of asthma. Many of the medicaments of special value in the treatment of asthma hold their ground first, by virtue of their iodin content; and, second, by reason of their facility of absorption by the gastro-intestinal tract. In the latter respect sodium iodid has an advantage over the potassium salt, and some of the newer preparations of iodin may even surpass both of them in individual instances.

Superior advantage has been claimed for the intramuscular injection of iodin because of quicker effects and ability to administer larger doses. I have used iodized oil of sesame for this purpose, but aside from those subjects which have iodiosyncrasy to the oral administration of iodin preparations, I can see no special benefit in the injection method. The continuous administration of iodin over a period of six or eight months, in doses that will not disturb the patient, is necessary in order to obtain the best results.

Arsenic is a very useful remedy in asthma. In the form of arsenical cigarettes it is at times very effective in mitigating or preventing attacks.

Grindelia robusta and euphorbia pilulifera are of considerable value for continuous use in connection with iodids. Stramonium, belladonna and lobelia are of most service for the relief of threatened spasm. A pill containing one-half grain of ext. of belladonna, one-third grain of ext. of stramonium and two and one-half grains of conium, given at bed-time is often of value in preventing nocturnal attacks of asthma.

Quebracho is a drug which has been called the "digitalis of the lungs." It has been used for various forms of dyspnea, and is a stomachic tonic. In over-doses it is said to produce dyspnea and asphyxia. The fluid extract and tincture of the drug have not been regular or effective in their action, and have been comparatively little used.

Recently I have used the active principle of quebracho, aspidospermin, with some rather remarkable results. The market affords an amorphous form of aspidospermin, also a hydrochlorid. The dose of the former is

from one to two grains, and of the latter from one-half to one grain. I have so far used only the amorphous form.

The effect of this remedy has been very satisfactory in those cases in which there was a very evident bronchial factor in the maintenance of the asthmatic state. Even with the presence of marked emphysema and a weak heart, the relief obtained was marked and lasting.

One patient, a man, had suffered from asthma for thirty years. There were areas of bronchial irritation in both lungs, one of which, in the lower right lobe, anteriorly, refused to clear up under any kind of treatment, dietetic, climatic, sedative, antispasmodic, or iodids by mouth or by injection. He was steadily getting worse. Adrenalin relieved the spasm, but secondarily increased the bronchial distress. Morphin was the only thing that gave relief, and the use of this drug became necessary once in from twenty-four to thirty-six hours. Aspidospermin gave him immediate relief in preventing the return of spasm, and, by the daily use of from one to three doses complete relief of both asthmatic spasm and bronchial difficulty was obtained.

CARCINOMA OF THE UTERUS IN THE NON-PREGNANT AND PREGNANT

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CHICAGO, ILL.

The importance of the careful clinical consideration of carcinoma uteri can be well understood when one remembers that it is estimated that, in Great Britain one in thirty-five of all women over 35 years of age die of uterine carcinoma (Webster).

Even though there may not be more than subjective clinical data on which to base most of these cases (the only true objective diagnosis being the microscopical), they yet can be accepted as approximately correct if we remember that 6 per cent. of women applying at the Greifswald clinic had carcinoma (Martin) and 3 per cent. at Chrobak's clinic in Vienna.

If the much greater frequency of carcinoma in women is as stated (three in women to one in men) largely due to the very great frequency of uterine and mammary carcinomata, it must not be forgotten that adenoma, sarcoma and chorio-epithelioma malignum uteri cause subjective symptoms which are much the same as carcinoma, as indeed do the benign polypus and submucus fibroma. Further consultation of the figures shows that, of the women dying of carcinoma, nearly one-third had uterine and nearly one-sixth mammary carcinoma. This is supported by the fact that in Stuttgart 28 per cent. of all the carcinomata in women were uterine carcinomata (Fehling).

THE ETIOLOGY OF CARCINOMA UTERI

1. *Hereditary influences* are difficult to estimate; probably they act in many ways as favoring factors. In all cases of consanguinity we must not forget the fact that the relatives are liable to be more frequently in close contact with the disease, and often suffer poor health in consequence, and are therefore perhaps more liable later to develop carcinoma.

The Cohnheim theory of misplaced embryonal cells that later, due to a lack of inhibition, or to some unknown stimulus, become active and develop into heterologous tumors, is as irrefutable to-day as on the day of its invention.

Hauser and Hansemann's idea that carcinomata are possibly due to some changes in the normal epithelial cell condition by which it takes on unrestricted multiplication and anaplasia is, considering our knowledge microscropically of erosions, endo-cervicitides and glandular endometritides and adenomatous changes, deserving of serious consideration.

One might also apply here the lysin theory that is so intimately identified with chorio-epithelioma malignum and say that when certain anti-bodies or lysins are at a low ebb in the woman's circulation that such a woman with or without a uterine Cohnheim embryonal deposit or a Hauser and Hansemann's hyperplasia, is liable to develop a carcinoma. The transplantation experiments made with carcinoma cells without result on non-carcinomatous patients prove nothing; while the metastatic and implantation growths in carcinoma patients, in a measure support this lysin theory. Bacteriologic causative factors if still unproven are very possible. The experiments with carcinomatous growths and sera on animals do not come within the scope of this clinical paper.

2. *Age.* In reckoning by decades we must always remember that the frequency is greatest towards the end of each decade. Schauta saw carcinoma uteri in a girl aged 17, and Fraenkel in one at 19 years of age. Gusserow in 2,265 cases found .01 per cent. were in women under 20 years, 3.5 per cent. between 20 and 30 years (Kuestner, 2 per cent. under 30), 21 per cent. between 30 and 40 years and 34 per cent. just before, at or after the climateric, viz., between 40 and 50 years of age. Between 50 and 60 years of age only 26 per cent.; between 60 and 70 years of age only 11 per cent., and after 70 years of age only 3.5 per cent. of the cases occurred. As there are fewer women living after 60 years of age it makes the frequency in advanced age appear less than it really is.

3. *Sexual intercourse, fecundity and the sequelæ of labor* seem to have a marked influence. In Vienna of 1,000 women with uterine carcinoma, 299 were single, 503 married, and 268 widows; but no unusually great tendency to develop carcinoma is for some reason shown by prostitutes (Glatter). Williams' statement that lues does not predispose to carcinoma is supported by Lomer and denied by August Martin. The average number of term births was 5.02 each (Hofmeier). In a large number of cases the women were overdue; i. e., had carried their children in utero more than the allotted 280 days (Saunders). The writer has also noticed the fact that the pregnancies often followed one another

rapidly, with only a short non-pregnant interval. In the nulliparous only 5 per cent. had carcinoma, especially in the corpus, while parous women formed 95 per cent. of Schroeder's carcinoma cases. The violent traumata during spontaneous or instrumental labor, with the attendant lacerations of the cervix, that occur to some extent in even the best managed cases, and often heal imperfectly, leaving a very patent external os, or indeed gaping cervix allowing the easy ingress of low-grade inflammation, and hyperplasia excitants, probably is an important predisposing factor.

4. *Neglected acute inflammations becoming chronic, e. g.*, chronic endocervical catarrh of long duration is probably often followed by endocervical carcinoma (Schroeder). Cases of carcinoma endo-cervicis under treatment for months for a supposed catarrhal inflammation occur in the experience of every gynecologist. That poverty, under-nourishment, and unhygienic housing predispose to uterine carcinoma, is very probable. In Schroeder's public clinic 3.6 per cent., and in his private practice 2.2 per cent. of the women had carcinoma. Worry and depressed spirits were suggested as predisposing factors by Scanzoni.

Carcinoma of the uterus may be divided into three kinds as to their locus primæ originis: carcinoma of the portio vaginalis cervicis; carcinoma of the endocervix uteri, and carcinoma of the corpus uteri.

If the site of origin of a uterine carcinoma can usually be recognized in the very early stages, in the advanced stages it is often impossible to do so either macroscopically or microscopically.

CARCINOMA PORTIO VAGINALIS UTERI

This carcinoma is estimated to occur on an average at about 42 years of age on that portion of the cervix which hangs free in the vagina and is normally lined externally by many layers of squamous vaginal-like epithelium. The portio vaginalis carcinoma takes its origin from the superficial squamous epithelium of the portio vaginalis or from the epithelium at the transitions place.

The connective tissue of the portio may take on very active growth, squamous cell-lined papillary growths may protrude from the portio surface into the vagina, hanging from one lip of the cervix papilloma-like, or as a broad globular swelling, sometimes hiding the healthy lip, or indeed both the lips of the cervix may be involved. In other cases the portio carcinoma proceeds from a very small area of origin and grows directly deeply into the portio vaginalis, followed by an early cell necrosis and loss of superficial substance, the so-called (often deep) carcinoma ulcer, which may even undermine the whole portio circularly.

The spreading of the portio vaginalis carcinoma is usually downwards invading the vaginal mucous membrane and but comparatively rarely upwards invading the cylindrical cell-lined endocervix. The vagino-cervical junction, and the whole upper part of the vagina, may be involved by this secondary vaginal carcinoma, which, in some cases, may even extend down as far as the introitus vaginæ. This tendency of carcinoma cells to more easily invade by continuity an area covered by

like cells to those from which it was derived, i. e., the portio vaginalis squamous celled carcinoma to invade the squamous cell-lined vaginal wall, seems almost as if the cells of a different character in an adjoining area had the power to a certain extent to temporarily resist the invasion of carcinomata derived from cells of another type. As the portio vaginalis uteri carcinoma penetrates deeper into the cervical substance it may relatively early spread upwards under the external longitudinal muscular layer of the uterus to the corpus uteri (see Fig. 1). In two out of nine of these cases examined microscopically it had passed above the level of the internal os (Seelig). The invasion of the paracervical and paravaginal connective tissue by the portio carcinoma will be taken up with the paracervix and parametric invasion by the endocervical carcinoma.

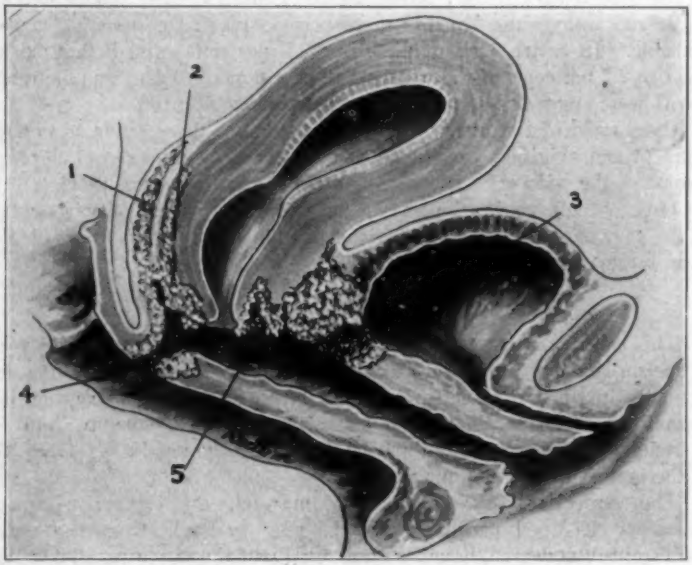

Fig. 1.—Carcinoma of the portio vaginalis uteri. (1) Invasion of parametrium. (2) Traveling upward to corpus uteri. (3) Para-cystium invasion and vesicovaginal fistula. (4) Para-proctium invasion and proctovaginal fistula. (5) Carcinoma ulcer of portio with extension by continuity onto the vagina.

CARCINOMA ENDOCERVICIS UTERI

This cylindrical cell carcinoma is said by Winckel to occur at an average age of about 47 years. It begins in either the superficial cylindrical endocervical epithelium or from the cylindrical epithelium of the mucous glands of the endocervix. The cylindrical cell carcinoma from the superficial mucosa may spread superficially and also deeply and penetrate to the submucosa and spread rapidly upward toward and invade the corpus by the submucous connective tissue. There is apparently less tendency at least at first to spread downwards onto the

squamous cell covered portio vaginalis. In some cases the endocervical carcinoma is characterized by the dipping into the cervix of solid tap-like processes similar to those of the portio carcinoma. The endocervical cylindrical epithelium may lose its cylindrical shape and become flat epithelium, in which event necrosis and ulcerations are very liable to be marked, often much enlarging the endocervical cavity. In other cases the carcinomatous growths may fill the cavity of the endocervix and if there be gaping due to old lacerations, it may appear at first sight through the speculum much like a papillary portio vaginalis carcinoma.

Carcinomata originating deeply in the mucous glands of the endocervix may occur as a small sharply circumscribed hard tumor often deeply situated in the wall of the cervix. Later it may enlarge to an unshapely tumor and infiltrate the whole thickness of the cervix, and indeed invade the parametrium before necrosis and ulceration through on to the endocervical mucosa has occurred. The corpus uteri may later be invaded via the submucosa as in the carcinoma originating in the superficial mucosa. If the external os be narrow there may, at least at first, be nothing in the appearance on inspection through the speculum of the often normal appearing portio vaginalis to indicate the exuberant malignant growth, or wide-spread ulcerative destruction within the cervical canal. In other cases a low situated circumscribed intra-mural endocervical carcinoma on undergoing necrosis may early rupture through onto the portio vaginalis surface and be mistaken for a primary portio carcinoma ulcer.

Both the portio vaginalis carcinoma and the endocervical carcinoma invade the paracervical and parametric tissues early. The portio carcinoma can by an early breaking through the vaginal wall invade the paravaginum. Foci of carcinoma cells from either the portio or endocervical carcinoma often appear early in the vesico-uterine ligament anteriorly and recto-uterine ligament posteriorly by metastases via the lymph-channels or by direct carcinomatous infiltration of the connective tissue spaces. This carcinomatous infiltration of the paracervical tissue is often irregular, but may, especially in carcinomata of endocervical origin, be so regularly and evenly distributed as to give the sensation to the examining finger of a colossally large and hard cervix. The ureter may be so surrounded and compressed by the paracervix invading carcinoma as to cause hydronephrosis.

The ureter wall itself apparently withstands invasion by carcinoma cells for a considerable time, the lumen sometimes later again becoming patent if softening of the paracervical carcinoma cells takes place.

Infiltration necrosis and rupture through, with the formation of ureter fistula can ultimately occur; indeed many of the postoperative ureteral atresiae and fistulae, for which the surgeon is wrongly blamed, are due to this. In a young woman, aged 37 (on whom a hysterectomy for carcinoma had been performed one year previously), operated on by Dr. Arthur M. Bishop at the Passavant Hospital for a kidney tumor, the operation revealed a hydronephrosis, the loose paranephritic tissue was filled with hard masses which when examined microscopically by Dr.

Evarts Graham proved to be carcinoma metastases. Fritsch emphasizes the fact of the malignancy being especially marked in young women.

At autopsies all too little attention is given to exploring the preperitoneal tissue and retroperitoneal tissue for evidences of carcinomatous invasion, though it is common in very advanced cases to find clinically, hard masses (probably carcinoma) in the anterior abdominal wall.

The paracystic invasion is followed later by invasion of the musculature of the bladder by the carcinoma cells which may gradually encroach on the vesical mucosa displacing it inwards and causing a (catarrhal like) endocystitis. Later carcinomatous infiltration and necrosis of the entire thickness of both the bladder and vaginal wall may result in vesicovaginal fistula.

Rectovaginal fistulæ though more rare are either due to carcinomatous invasion first of the vaginal wall and then infiltration and rupture directly through into the rectum, or the carcinoma cells having first invaded the posterior paracervix and paravaginum, later infiltrate, followed by necrosis and rupture both anteriorly through the vaginal and posteriorly through the rectal wall. In 79 cases Eppinger saw 20 per cent. vesicovaginal and 4 per cent. rectovaginal fistulæ. The pelvic peritoneum may be gradually implicated from the parametric foci. Adhesions may form early and temporarily wall off the carcinoma invaded area from the general peritoneal cavity. Douglas' sac may gradually become obliterated or walled in by adhesions or the whole pelvic contents become one carcinoma-cell infiltrated adherent mass extending as high as the umbilicus.

The insidious onset of ascites (in the absence of renal, hepatic or cardiac, or other peritoneal, e. g., tuberculosis lesion) in a case apparently successfully operated on for uterine carcinoma some months previously, is always a suspicious sign of peritoneal and omental invasion. In one such case which had been diagnosed as typhoid, the writer was easily able to palpate the carcinomatous growths in the omentum, despite the ascites. The diagnosis was confirmed postmortem.

Spreading of the carcinoma from the parametric connective tissue to the muscles, periosteum and bones of the pelvis can occur in advanced cases. The destruction of the pelvic organs may become so great that only a single opening remains into which the bladder, uterus and rectum empty, the so-called pathologic cloaca. Every trace of the uterus may become lost before the destruction has reached the degree described above. Winter's conclusion that the retroperitoneal glands were only involved after the carcinoma had broken into the parametrium is questionable. Metastases may also occur in the ovaries, liver, lungs and other distant organs.

CARCINOMA CORPUS UTERI

Carcinomata occurred in the corpus in 3.4 per cent. in 812 cases (Hofmeier), and in 6.3 per cent. in 848 cases (Krukenburg), while in Wuerzburg it occurred in nearly 13 per cent. of 251 cases.

Carcinoma originating in the corpus occurs but rarely between 30 and 40 years of age and only occasionally between 40 and 50. The

majority of cases being between 50 and 60, average about 54 years (Winckel).

Insufficient or lack of physiologic activity apparently favors the occurrence of corpus carcinoma, as old nulliparæ composed 21 per cent. of the cases and only 3.6 per cent. were multiparæ, entirely refuting the idea that fecundity is a predisposing cause.

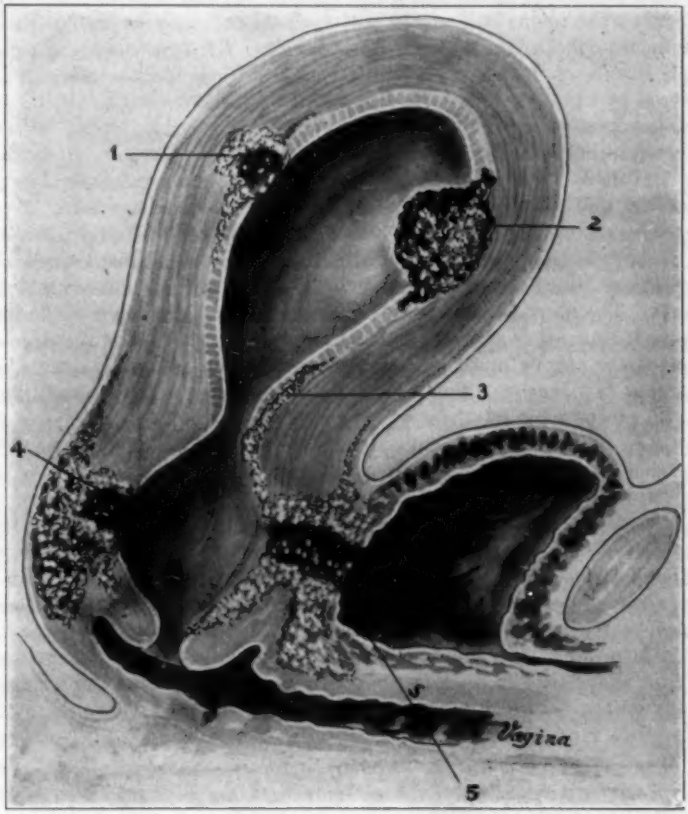

Fig. 2.—Carcinoma of corpus uteri. (1) Carcinoma ulcer with gradual invasion of the musculature and extension downward under the mucosa. (2) Carcinomatous growth extending superficially and protruding into the uterine cavity. Carcinoma of the endocervix uteri. (3) Carcinomatous extension upward underneath the mucosa. (4) Carcinomatous ulceration and invasion of the musculature and parametrium. (5) Carcinomatous invasion superficially and deeply anteriorly with cervicovesical fistula.

The site of origin of the corpus carcinoma may be in the corpus glands or the new formed glandular hyperplasiæ, though the cylindrical epithelium of previously normal appearing glands can proliferate to such a degree that the whole gland lumen may become filled, giving an alveolar carcinomatous formation, with later rupture through the basement membrane.

Necrosis and rupture into the cavity of the corpus uteri and the formation of the carcinoma ulcer occurs as in the endocervical variety. The enigmatical endometritides glandularis hyperplastica that give us the saw, corkscrew and other bizarre forms, in some cases perhaps later develop into the adenoma malignum destruens, perhaps also become carcinomatous as pointed out by Hauser and Hansemann.

The superficial endometrium of the corpus may also be the site of origin of carcinoma and spreading occur superficially as well as down deeply into the muscular wall of the uterus. In rare cases the superficial surface of the mucosa of the corpus uteri may become more or less covered by flat squamous epithelium (icthyosis endometrii). Such cases are very prone to become carcinomatous with an early dipping destructively into the musculature, which seems to be very characteristic of this type (Teller). Carcinomatous growths in the corpus endometrium like those in the endo-cervix occasionally protrude into the uterine cavity either as a broad based polyp or more frequently as a diffuse infiltration of the mucous membrane, especially just previous to the necrosis and ulceration. The corpus carcinoma may little by little also invade the cervix. The uterine corpus wall becomes gradually destroyed by the progressive infiltration and necrosis of the carcinoma cells, but the destruction of the corpus muscle substance is comparatively slow, due to the energetic resistance of the muscular tissue itself and the peculiar division of the corpus lymph vessels, which in their nulliparous undeveloped, or senile atrophied condition seem to be somewhat unfavorable to the rapid invasion by carcinoma cells. Even voluminous growths are occasionally seen apparently still limited to the uterine wall though the carcinoma had probably existed a year or longer. Gradually, however, the carcinoma cells usually perforate the musculature, push up and later pass through *the overlying uterine peritoneum,* when adhesions circumscribing the advancing tumor cells may temporarily wall off the general peritoneal cavity, or the onset of free ascites be the first symptom of a metastatic invasion of the peritoneum and omentum. General diffuse peritonitis and death from defective circumscription is always possible if infection occurs, which is surprisingly infrequent when one considers the close proximity and indeed implication of the intestines.

The subjective symptoms of portio vaginalis, endocervical and corpus uteri carcinoma are usually entirely absent at the very onset of the disease.

1. *Hemorrhage* in the early stages of a circumscribed glandular intramural carcinoma focus, may be absent till the carcinoma either approaches or reaches the surface, or actual necrosis and ulceration of the mucosa occurs. Bleeding probably occurs earlier in the superficial carcinoma. Clinically spontaneous hemorrhage should be considered a sign of relatively advanced disease. More than the usual loss of blood at the period (menorrhagia) in a woman, especially between 35 and 40 years of age or older, in the absence of any other apparent cause, e. g., abortion or fibroid, or hemorrhage between the periods (metrorrhagia) due to trauma, e. g., coitus, digital examination, sounding, or spontane-

ously, however slight, demands immediate bimanual examination, inspection, curettage and exsection, for microscopic examination. While not every woman with whom the classical lessening of the number of days and quantity of the menses does not occur as she nears the average cliimacteric (age of 45) has carcinoma, yet diagnostic means should always be resorted to, to make a correct diagnosis of the actual condition present. After the normal climacteric or menopause, the reappearance of uterine hemorrhage is almost pathognomonic of carcinoma, except in rare cases. I have in my records one of these very exceptional cases who is still alive and well, Mrs. D. G., aged 59, multipara; widow, passed climacteric fifteen years ago, bleeding continuously for the past nine weeks, curettage, microscopic examination by Max Herzog, negative. Patient is in good health to-day at 69. No sign of bleeding has occurred since the curetage for diagnosis.

2. *Odor* may be absent for months after metrorrhagia begins, or if present, be unnoticed by the patient herself, but when necrosis and decomposition set in, the odor usually becomes very marked, and the discharge of dark gray, yellow, green, brown or black shreds, detritus and blood from the necrotic ulcerated surface occurs.

3. *Pain* from the carcinoma at least at first can be entirely absent, or at most only a slight sacral pain or feeling of pressure in the pelvis. As the carcinoma invades the parametrium with the often added small cell infiltration of decomposition and pus infection of the ulcer it may be very severe. The more violent the harder the growth, yet occasionally undoubted cases which refuse operation, go years with but little pain. In one case an apparently small growth may be accompanied by more pain than a larger growth in another. Carcinomata that ulcerate late and others that ulcerate early may be equally painful. Lastly the pain can be from some other cause as well as the carcinoma, e. g., the adhesions from old inflammatory foci. Intermittent uterine colic due to uterine contractions consequent on carcinomatous stenosis of the internal os and cervical canal and mechanical interference with the free discharge or atresia with complete retention of the intra-uterine secretion is common. This pathologic gynatresia in corpus carcinomata often accounts for the temporary cessation of the hemorrhage and unfortunate neglect of diagnostic procedings.

Distention of the uterus (hydro-hemato-pyo-physo-metra) to the size of the pregnant uterus at the fourth month or even larger is usually followed later by painful uterine contractions, rupture of the obstructing carcinomatous tissue and discharge of the foul-smelling uterine contents. An interesting case of this kind caused the patients and friends to refuse to believe the writer's diagnosis till the rupture occurred months later. Peritonitic pain and irritation with increased rigidity of the abdominal wall and even vomiting may occur when the carcinoma reaches the peritoneum.

4. *Metastases. The invasion of the neighboring pelvic organs* is very important to recognize clinically as a contra-indication to the performance of a radical operation, e. g., the dysuria and strangury and

cystitis indicating invasion of the bladder wall and the paraproctium and rectal wall invasion by pain or tenesmal diarrhea. The vesico-vaginal and recto-vaginal fistulæ when present are very obvious and distressing.

5. *The cachexia* often sets in only very late in the disease; indeed, patients with comparatively advanced carcinoma often show neither loss of weight nor anemia, causing the doctor himself to doubt the possibility of carcinoma and to lose valuable time administering ergot, hydrastis and local treatments. Later, the toxins from the carcinoma tissue itself, from the decomposing necrotic tissue, saprophytic, and often pus infection, at the site of the ulceration, the loss of blood and anemia, the anorexia, disturbances of digestion, and the formation of intestinal toxins, loss of weight, pain and loss of sleep, soon accentuate the characteristic condition.

The dullness of intellect, or indeed, soporose condition, which is common in the later stages of carcinoma, due partly to the toxins and partly perhaps to the oft present uremia consequent on ureteral pressure, and perhaps contracted kidney common at this age, or other causes, probably mercifully lessens the patient's suffering. In the last stages the characteristic anxious facial expression leaves, the patient replies but indifferently to questions, giving only short answers, as she gradually dies of marasmus, often in coma; if no intercurrent disease or embolism happily ends the life sooner.

THE DIAGNOSIS

In the portio vaginalis hard foci or a general hardness is always a suspicious sign near or at the climacteric age, but we cannot afford to forget that the especially malignant cases in the early thirties or indeed before then, are still more liable to be overlooked than those at the climacteric. Shaggy or irregular portio growths are very liable to be carcinomatous, even if they do not bleed easily to the touch. In further advanced cases the portio carcinoma may have a sharp outline, be polypoid or ulcerated and bleed spontaneously or indeed be easily made to bleed by the examining finger. The so-called characteristics of the simple ulcer, erosions, true chancre, syphilitic, tubercular and carcinoma ulcer are as idle to relate as are the simple mucous, fibroid, adenomatous, sarcomatous and carcinomatous polyp in this microscopic age.

Inspection in portio vaginalis carcinoma by speculum may reveal the irregularity or shaggy growth or ulceration, but it is also always possible that a circumscribed focus hard to touch, can lie deep in the portio which is entirely unchanged in appearance.

The endocervix with an early superficial intra-cervical carcinoma may give the same subjective symptoms as a catarrhal inflammation and may not give the sensation to touch of hardness and thickness of the cervix. By squeezing the cervix with the examining fingers one can often elicit bleeding or the introduction of an aseptic sound into the cervix may reveal an exuberant growth or increased roominess and bleeding both. In both the endocervical and portio carcinomata before the menopause, pregnancy can be easily overlooked if there be spontaneous hemorrhage,

but an increased softness of one part of the cervix and a hard focus in another should always cause suspicion of pregnancy and carcinoma.

Lastly, the advanced intra-cervical carcinoma may often give the sensation to the examining finger of a very large and hard cervix, but not change the portio in any way whatever in appearance through the speculum, unless lacerations and gaping of the cervix should allow the carcinoma ulcer to be seen, or if exuberant, to protrude from the external os. By a speculum inspection alone one may be entirely thrown off one's guard in very advanced endocervical cases.

Corpus carcinomata may give either local or general increase of hardness and increase in size of the uterine body, though in the early stages both of these may be impossible to elicit. The menorrhagia or metrorrhagia often being the only suspicious sign.

Thorough curettage and exsection of shaggy or hard foci from the cervix, should always be followed by a careful hardening, staining and microscopical examination by a competent pathologist in every case and especially so when suspecting malignancy. Those who do not happen to have laboratory facilities or the time, can by placing their scrapings, etc., in alcohol, and securely corking, mail in a regular mailing carton to any good laboratory. If the scrapings from both the cervix and body and the exsection be reported non-malignant, and the menorrhagia or metrorrhagia subside, then is there the satisfaction of having done one's full duty.

If the hemorrhage continues it points to the possibility of a small superficial carcinoma or a focus deep in the uterine wall; e. g., originating in a gland having escaped the curette; or that the hemorrhage is from another cause, e. g., submucous fibroids. The continuance of hemorrhage despite the negative curettage, demands immediate hysterectomy in the absence of any contra-indication either systemic or metastatic.

The prognosis, prophylaxis and treatment of carcinoma uteri depends on the very early microscopic diagnosis of all uterine lesions and immediate operation if carcinoma be present.

A hysterectomy performed while the entire carcinoma is still entirely within the wall of the portio vaginalis or of the supra-vaginal cervix or of the corpus, will give a good prognosis.

1. If it has invaded the paracervical or parametric cellular tissue to any degree and metastases have occurred in distant lymphatic glands, then is it impossible to remove all of the carcinoma by hysterectomy, even though all the involved retro-peritoneal glands should be also removed, which is improbable; the paracellular tissue would probably still contain carcinoma cells. Slight carcinoma cell infiltration of the parametrium and paracervix is impossible to diagnose.

2. The uterine mobility, i. e., the ability to move the uterus freely from side to side and to draw it down by the volsellum attached to the cervix, till the portio is at the vaginal introitus is only of relative value as a sign of parametric freedom from carcinoma.

Old peritonitic adhesions or old parametric inflammatory induration may be present concomitantly with a carcinoma that is still only in the

wall of the cervix and the limitation of mobility cause hesitation when conditions were really favorable for operation.

An early superficial ulcerated, saphrophytic and pyogenic infected carcinoma, with the attendant small cell infiltration, appears clinically to

Fig. 3.—Uterine scrapings drawn from actual slides by the author, giving a slight idea of the variety of uterine contents and endometric changes, the nature of which can only be diagnosed microscopically.

be further advanced, and may fix the uterus parametrically by the inflammatory infiltration, when the carcinoma itself has not yet invaded the parametrium or at least only very slightly so.

If one may judge by analogy the writer in one case of intestinal obstruction made the diagnosis of sigmoid carcinoma microscopically from the removed sacral glands, though the mesentery was clinically devoid of infiltration; later in Cook County Hospital in a like case apparently much further advanced the writer found no sign of enlarged glands.

In all cases of rectal and vesical implication by carcinoma uteri (signs of which are above described), radical operation is to be proscribed.

Lastly, slight limitation of mobility due to carcinoma cell infiltration of the parametrium might easily escape notice by the most experienced, also metastases in the retroperitoneal iliac lymphatic glands are impossible to diagnose and may have occurred even though the parametrium still be free.

Poirier states that the inguinal lymphatic glands drain the vulva and lower one-third of the vagina and also the cornua uteri via the ligamentum teres. The iliac glands which lie at the bifurcation of the external iliac and hypogastric arteries drain the upper third of the vagina and cervix.

The lumbar lymphatic glands near the lower edge of the kidney drain the corpus and fundus uteri, except the cornuæ, via the lymph channels along the spermatic artery.

Prophylactically, what relation Neisser's gonorrheal or puerperal infections have to the cause of carcinoma uteri is difficult to say; but we do know that especially gonorrhea plays a considerable rôle in the etiology of the glandular endometritides of the chronic hyperplastic type, and, that it in advanced stages, results in all kinds of bizarre forms often passing to a "near" adenomatous stage, that should prompt gynecologists to consider carefully the prophylactic treatment of all inflammations and their sequelæ, and an intimate knowledge of the hyperplasiæ of the endometric glands certainly incline one to favor the much maligned curettage and intra-uterine antiseptic packing as well as the careful examination microscopically of the small or large amount of the scrapings, however innocent in appearance macroscopically.

The careful repair of all cervical and perineal lacerations, especially when nearing the climacteric, should also be the aim of all practitioners and thereby endeavor to avoid the easy ingress of the non-specific infections, which also lead to catarrhal inflammations, erosions, and other hyperplasiæ that may possibly become malignant. If carcinoma is diagnosed early enough then total hysterectomy either by laparotomy, or per vagina or by both, with removal of as much of the broad ligament as possible and the sacral glands.

The preparation of the patient should always be made both vaginally and abdominally in every case whichever operation is intended, so that, in case of need of the other route there is but little delay. Freund's total uterine extirpation by laparotomy did not at once become popular because of the fear of infecting the abdominal cavity. It certainly gives a chance to control the hemorrhage and oversee the operation's field.

Hysterectomy should always be preceded by a thorough curettage and cauterization, and if possible, suturing of the antiseptically prepared cervix to avoid contamination of the operation's field with the malignant and often septic discharge.

Rydgier first divides the vaginal mucosa then does the laparotomy. Veit advised Freund's operation via the abdomen and then, when the broad ligament is ligated and divided, pulls down the uterus and finishes the rest of the operation per the vagina.

An endeavor should always be made to remove as much of the broad ligament as possible, the "crux" being at the cervix where we not only have greater danger of the metastases having involved the paracervix tissue, but we also have to "hug" the cervix to avoid the ureters, which avoidance can be better supervised from above. Vaginal hysterectomy that hitherto has been the popular operation, really is not so much less dangerous than the abdominal route is, in these days of improved technic in laparotomies and Fowler's post-operation position. Vaginal hysterectomy is also often very difficult through narrow nulliparous or senile atrophic vaginæ and it is often impossible to avoid carrying infection from the cervix into the pelvic peritoneal cavity during the manipulations to bring the uterus down.

The palliative treatment for inoperable cases is to limit the hemorrhage and by the judicious use of antiseptics avoid infection and decomposition as much as possible, with opiates for pain. Curettage in very advanced cases should be done very carefully, and then only in selected cases; always avoiding perforations through into the bladder, peritoneum or even rectum.

CARCINOMA UTERI IN PREGNANCY AND LABOR

1. *Carcinoma of the Corpus Uteri in Pregnancy.*—Pregnancy in a corpus carcinomatous uterus is comparatively rare because carcinoma here is most frequent years after the climacteric or menopause. In corpus carcinoma cases, before the menopause, the general weakening of the whole organism of the woman and the local carcinomatous changes in the corpus endometrium apparently have an inhibitory influence. If the corpus carcinoma involves the whole endometrium of the body of the uterus total sterility as a result would naturally be expected. If the endometric focus is still very small and conception does occur on the still healthy portion of the endometrium the pregnancy may only last one or two months. The cases that continue longer than this are questionable. (Sarwey and Theilhaber.)

2. *Carcinoma in the Endo-Cervix and Portio-Vaginalis in Pregnancy.*—The tumor here, if most frequent near or at the climacteric, is yet common in the early thirties. That a woman already has a carcinoma and then becomes pregnant is considered the more frequent. In such cases there is usually a well-developed carcinoma present in very early pregnancy. If the pregnancy is far advanced and the carcinoma of the cervix is very small, the natural inference is that the carcinoma probably developed during the pregnancy. The two points to consider are the

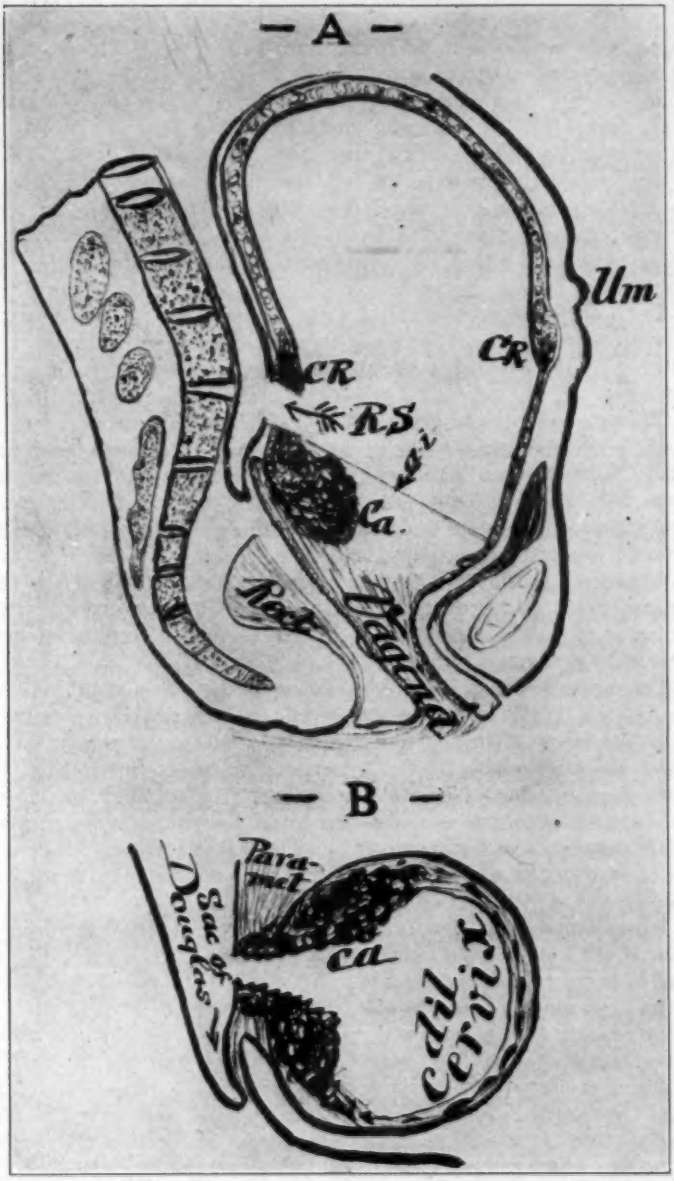

Fig. 4.—Carcinomatous cervix in labor. (A) Uterus with "C R" contraction ring warning danger of rupture just above internal os, as shown by elevation "EL" just below umbilicus "Um." Rupture site of uterus posteriorly "R. S." shown by long arrow pointing to opening in the uterine wall and parametrium and peritoneum into the peitoneal cavity. "A-i" with the small arrow pointing in the axis of pressure at the inlet with carcinoma "ca" in posterior lip obstructing labor. (B) Rupture through undilatable portion of carcinomatous "Ca" cervix into parametrium and peritoneal cavity. Dilatable portion of cervix "dil cervix" distended to utmost.

frequency of carcinoma in pregnancy and the frequency of pregnancy in carcinoma cases. Orthmann places the frequency at one case of carcinoma in 670 pregnancies; Glockner, one in 1,500; the Tuebingen Clinic, one in 2,000. Wertheim found six women pregnant in 600 carcinoma cases, or 1 per cent., and Glockner 1.7 per cent.

The endocervical and portio carcinomata probably both hinder the ascent of spermatozoa by the carcinomatous secretion, and the endocervical carcinoma also by the destruction of the arbor vitæ, but neither hinder conception within the corpus uteri if impregnation of the ovum occur.

The four points to consider are the influence of pregnancy on the cervical carcinoma, the influence of the carcinoma on the pregnancy, the influence of the carcinoma on labor and the influence of labor on the carcinoma.

The prognosis of carcinoma uteri, whether of the corpus, or of the cervix, is rendered much worse by the pregnancy. It spreads much more rapidly in depth and width of infiltration than in the non-pregnant uterus, because of the hyperplasiæ of pregnancy, the consequently greater blood-supply, the increased development of the lymph-vessels and the increased looseness of the intermuscular and parametric spaces by which the carcinoma cells metastase. Carcinomatous metastases of the iliac, retroperitoneal glands that drain the cervix and upper third of the vagina, as well as infiltration of the paracervix-metric cellular tissue is liable to be very early in these cases.

The influence of the cervical carcinoma on the course of pregnancy is usually such that 30 to 40 per cent. terminate fortunately by abortion or premature labor (Cohnstein), due perhaps to an early invasion of the corpus endometrium or of the intermuscular spaces, interfering with either the formation of the decidua, muscular hypertrophy, and hyperplasia and dilatability of the uterus, or both. Beckmann, however, places the abortions only at 8 per cent., while Theilhaber and some others contend that abortion is not more frequent than usual, and Pinard even states that it is less so.

Winckel advises in early pregnancy if the case is still operable: only think of the woman, remove both the uterus and fetus at once; this has been done up to the fifth month. After the *fifth month*, empty the uterus first and later, if operable, do hysterectomy. If near viability (twenty-eighth week), and the cervix carcinoma be very slight in extent, induce immature labor, or mother may elect to wait till the child is viable. The nearer to term the more is the dystocia increased, even the healthy corpus musculature may be taxed to the limit, or may be too crippled from apparently slight carcinomatous infiltration to overcome the rigidity of the carcinomatous cervix.

Uteri apparently with but slight local carcinomatous infiltration of the cervix, may be extremely slow in dilating (seven to nineteen days) and tear deeply into the parametrium with profuse hemorrhage or sepsis or even into the peritoneal cavity itself with resultant fatal peritonitis. The child is frequently born dead from the prolonged labor.

The uterine contractions under normal conditions would favor the dissemination of the carcinoma cells, while the prolonged labor of the slow dilating carcinomatous cervix makes this doubly liable. The extensively carcinoma infiltrated cervix renders immature, much more premature, or term labor impossible.

Women have continued in labor a whole month and then died undelivered in the cases collected by Beckmann. Nineteen died undelivered out of 126 cases, from exhaustion, hemorrhage, sepsis or rupture of the uterus. Vaginal cesarean section saved all the viable children, and only resulted in 6.2 per cent. of deaths of the mothers in thirty-two cases. Abdominal cesarean section saved all the viable children with 6.97 per cent. of deaths of the mothers in forty-two cases; the uterus being removed at the same time. The expectant treatment resulted in the loss of 50 per cent. of the mothers, and 70 per cent. of the babies.

Gas Building, Chicago.

THE TREATMENT OF HEMORRHOIDS

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Hemorrhoids and their treatment so frequently have engaged professional attention that it would be unjustifiable to broach the subject now if the writer had not for many years practiced methods that may properly be described because they are distinctive, well-tried and simple.

The indications for operating must be rigidly drawn, since the non-operative treatment suggested is so frequently satisfactory.

Hemorrhoids should not be operated upon except: 1. When their removal is incidental to surgical intervention for some other purpose. 2. When non-operative treatment is (a) impracticable or (b) unsuccessful.

The positive indications, in patients in suitable general and local condition, are:

Bleeding, inflamed, irritable or *painful tumefactions* of *intractable* character. Patients should, as a rule, be urged to try the hygienic method. If not successful the operation may then be done.

Hygienic, non-operative treatment. It must be recognized that hemorrhoids should be treated when irritation causes them to bleed or gives rise to strangulation, spasm, neuralgic pain, pruritus, inflammation or other symptoms. Looked upon as mechanically obstructive bodies which interfere with normal function, hemorrhoids may be so managed that, in many cases they may be endured as an unpleasant or uncomfortable disability and not as a painful or progressive disease. Furthermore, it may well be imagined that the danger of cancer, which is a prominent feature in the grim vista of rectal disease, will be diminished by the management recommended.

Two factors are to be considered; the one the vulnerability of the rectum, the other the physically and chemically irritating feces.

If the management of hemorrhoids is primarily based on these principles the patient need have but little discomfort or suffering.

A. The promontories of the tumefactions are often the seat of dilated and congested veins and of poorly protected capillaries that bleed furiously in proportion to their size when the tumefactions are subjected to the constricting action of the sphincter or to abrasion by the passing feces. Then between the tumefactions are always folds and pockets in which can accumulate putrefying material which gives rise to acrid products that cause ulceration and fissuring or lead to inflammation and hypertrophy of the mucous and cutaneous structures.

The vulnerability of these tissues may be lessened by the use of a stiff ointment or paste, such as:

℞

Lanolin ..... ʒi
Ung. Zinci Oxidi ..... ʒvi
M. sig.: Apply locally.

This may be softened by adding vaselin or more lanolin, but it is desirable to have it stiff so that it will stick to the parts and act as a sort of protecting paint.

Medicaments may be added, such as opium, cocain, tannin, extract of belladonna, hyocyamus, etc. But it is usually much more satisfactory to use the simple ointment and to administer indicated remedies separately.

The application of a protecting ointment has the great advantage of filling interstices and preventing or diminishing the direct action of irritating material upon the delicate tissues.

B. The great importance of the inter-relations of fecal discharge and the anatomy and function of the bowel cannot be over-estimated when hemorrhoids are present. The tendency of downward-bearing, inspissated fecal masses is to roll outward the sliding mucous membrane and to evert it through the sphincter's grasp ready for strangulation, and the consequent injury of the vascular structures, together with incitement to inflammation. This injury may be prevented by: 1, The maintenance of a soluble state of the feces by the aid of a suitable diet and laxatives and 2, by the use of enemas when the bowels are about to move.

The diet should include but a moderate proportion of meat and should be rich in pultaceous vegetables and fruits. The very juicy fruits and vegetables are of small use. A most useful practice for many people is the eating of apples, bananas, pears or peaches an hour or two before retiring. Laxatives based on cascara sagrada must be used, if necessary, to aid in this important work.

If the sufferer from hemorrhoids will have a good fountain syringe in his bath-room the second great factor in the management will be assured with but little inconvenience. It consists in allowing no solid fecal matter to pass without the use of the enema. This means that the rectum is to be filled with water and the fecal matter surrounded,

softened and broken up before its discharge. Then, when the passage is permitted a column of water opens the bowel and allows the mucous membrane to slide back above the feces instead of pushing it forward and injuring it. After the passage the parts are to be bathed, dried and a dusting powder or a heavy ointment applied.

This management ought to be given a thorough trial by almost all sufferers from hemorrhoidal disease.

The simplest operative procedure consists in excising the masses by oval incisions, the axes of the incisions being parallel with the sphincter muscle. The muscle need not be injured. The incisions are carefully closed by many interrupted catgut sutures. A dressing of heavy zinc oxid ointment is applied.

DUODENAL ULCER*

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Two decades ago we were taught that in point of frequency the relation of duodenal ulcer to gastric ulcer was as 1 to 40.

As recently as 1910 Ewald gave it as his opinion that 1 to 40 was yet too high in favor of duodenal ulcer. This, however, is not his present belief. Mayo's last word, so far as I am informed, places the ratio at 3 to 2 and Mayo Robson at 2 to 3, Moynihan, 2 to 5, and Murphy, 1 to 3.

Godman states in the *Boston Medical and Surgical Journal* that duodenal perforation occurs 1/40 to 1/20 as often as acute appendicitis. Further, that of three cases of so-called stomach perforation, in reality two affect the duodenum.

By the predication of these clinical findings we were forced to the conclusion that 80 per cent. of duodenal ulcers were being overlooked, and were possibly masquerading as gastric ulcer, one of the diseases of the gall-bladder or pancreas, chronic typhlitis, perityphlitis, appendicitis or more probably a gastric neurosis. If it be true, then, that duodenal ulcer is relatively more frequent than has been supposed, remembering its greater tendency to bleed, and to perforate, than gastric ulcer, how desirable it is that all become acquainted with the fact. But is the reasoning correct? These facts were obtained clinically. The correctness of these statistics I do not presume to assail, but they apply to none but the cases operated on, taking no account of those cases which heal, as is attested by the scars so frequently found in section material.

The statistics of the Hamburg Eppendorf Institute covering the past four years, and published in *Münchener Medizinische Wochenschrift* for March 19, 1912, follow. There were made in that institution in the years 1908, 1909, 1910 and 1911, 8,534 sections as follows:

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*Read at the Sixty-Second Annual Meeting of the Illinois Medical Society, at Springfield, May 22-23, 1912.

	Sections.	Stomach Ulcers and Scars.	Duodenal Ulcers and Scars.
1908.....	2,016	16	2
1909.....	2,185	27	7
1910.....	2,239	20	11
1911.....	2,094	36	15
Total.....	8,534	99 1.1%	35.4%

To these add the statistics of the Pathological Institute at Kiel by Krug.[1] Among 12,020 sections, duodenal ulcers or scars occurred fifty-three times. Perry and Shaw found in 17,652 sections, seventy ulcers and scars, and you are able to total 38,212 sections, done upon persons of all ages, with a total of 158 duodenal ulcers or scars, or a percentage reduced to 0.41 per cent.

Etiology. Of the pathogenesis we know little; of the etiology, less. But it is not too much to suppose that through the medium of physiologic chemistry much assistance may be expected along these lines in the near future.

Among the predisposing causes have been enumerated diet, trauma, thermic influence, syphilis—10 per cent. of duodenal ulcers are said to be of syphilitic origin—infection, embolism, tuberculosis, vascular changes, as arteriosclerosis universalis, age, struma, puberty, burns and what not. Cramer quoting Brenton on round ulcers of the stomach, credits him with considering puberty, as well as old age, a potent factor.

In Nothnagle's "Diseases of the Intestine," I find from an etiologic standpoint ulcers of the intestines can easily be divided into a number of groups, as follows:

First Group: Ulceration as a result of necrotic processes: simple duodenal ulcer (including peptic ulcer of the jejunum); ulcers following cutaneous burns; embolic and thrombotic ulcers. (The peculiar ulcer of the intestine seen in patients with multiple neuritis belong to this class.) Amyloid ulcers.

Second Group: Ulceration as the result of inflammatory processes: catarrhal ulcers, follicular ulcer, simple ulcerative colitis, stercoral or decubital ulcer.

Third Group: Ulceration as a result of acute infectious diseases: typhoid dysentery, diphtheria, anthrax, sepsis, erysipelas, varioloid.

Fourth Group: Ulceration as the result of chronic infectious disease tuberculosis, syphilis, lepra, pellagra.

Fifth Group: Ulceration as the result of constitutional disease: gout, scurvy, leukemia.

Sixth Group: Toxic forms of ulceration: uremic ulcer, mercurial ulcer.

Six groups comprising twenty-four distinct classifications from an etiologic standpoint. Why not proceed indefinitely in the enumeration of imaginary causes for that unknown condition in the human body which induces the stomach to digest a circumscribed area of its own mucous lining? Page 256, same author, same volume, "Ulcer of the Intestines in Cutaneous Burns":

In most exceptional cases the ulcers appear in the stomach (in addition to other ulcerations in the intestines). In the majority of cases the duodenum is affected. My reason for not discussing this form with simple duodenal ulcer, like other authors, is that it is distinguished from the latter lesion both by its specific etiologic factor and by its course. I hardly believe any treatment will ever be successful in these cases.

1. After Safforth, D. M. W.: No. 15, 1911.

As a matter of fact, patients mortally sick from any cause have developed duodenal ulcer. Why not in the case of burns? Again patients apparently not otherwise sick succumb to duodenal ulcer. Other patients develop duodenal ulcer with few symptoms, or none, which heal, leaving only a scar to tell the story. When we know more of the pathogenesis of duodenal ulcer the etiology will be more clear.

The arteriosclerosis, old age, puberty and external burn theories are apparently refuted by Professor Frankel by the Hamburg statistics just quoted. Incidentally, the theory that gastric ulcer is more prevalent in women, is not upheld. Of the ninety-nine gastric ulcers, fifty-two were found in the male and forty-seven in the female.

There were among these sections, twenty burns of the third degree and there was found a single ulcer of the duodenum in a 1½-year-old boy. On closer examination this seemed to have appeared before the burning took place.

It is interesting to note that in the second ten years of life—obviously covering the age of puberty—there were among these 8,534 sections, one gastric and one duodenal ulcer.

It is generally accepted that through circulatory disturbances as embolism, thrombosis, hemorrhages, etc., a circumscribed part of the mucous membrane is separated from its circulation, becomes necrotic, and is finally digested by the acid gastric juices. The first segment of the duodenum extending to the papilla, since it is subject to the acid chyme, presents a like possibility as the stomach itself for the formation of peptic ulcer.

Eiselburg pointed out that after operation, especially of the abdomen, stomach and duodenal ulcers were liable to form, and sometimes with fatal bleeding.

Page has made the observation that these ulcers occur in inflammatory conditions of the appendix. As an explanation it is declared that because of ligation during the operation, especially of the omentum or mesentery, inflammation of the appendix, thrombus formation, secondary to infection, with retrograde extension, results in the shutting off of the circulation to a localized area in the stomach or duodenum. Page states that eight cases of twenty-six, operated on by him, showed such a condition. In the *Lancet*, London, No. 7, 1911, Herbert J. Patterson states that on looking over his histories for the past three years he finds that 66 per cent. of the duodenal ulcers operated upon by him showed changes in the appendix which were without clinical symptoms of appendicitis. This would suggest that possibly appendicitis could cause duodenal ulcer.

Differential Diagnosis: The differentiation of duodenal ulcer presupposes the consideration of many lesions, as well as functional disorders, in and about the pylorus. Carcinoma of the stomach and pancreas, carcinomatious degeneration of an ulcer, gastralgia, gallbladder disturbances, chlorosis, and angina; diseases of the pancreas, gastric crisis, hernia in the linea alba, congested liver, toxic hepatitis, intestinal parasites, enteralgia, kidney disturbances, appendicitis, gas-

tritis exfoliativa, ulcerosa, incipient tuberculosis, luetic and tuberculous stomach ulcer.

Of special interest is the differentiation of those processes in this neighborhood which cause pain. Pyloric ulcer, gall-stones and chronic inflammation in and about the gall-bladder; pancreatitis and new growths in the head of the pancreas; occasionally an inflamed appendix located high up. Less frequently are kidney stones or diseases of the pelvis of the kidney and ureters to be differentiated.

With the exception of stomach ulcers—malignant or benign—all the above mentioned diseases can be differentiated by the repeated demonstration of blood in the stools. Certainly bleeding may occur in cases of cholelithiasis or hepatic cirrhosis, but this is so seldom in these cases, and when present is associated with such typical symptoms, that it should cause no confusion. While it is also possible to get blood in appendicitis, as a matter of fact, there are only four cases of this kind in literature.

In the case of carcinoma the abdomen is less tender, and the vomiting is of the stagnation type. Carcinoma is more frequently palpable. Melena occurs in both, but after rest with a liquid diet with rectal feeding for a few days, the occult blood usually disappears in the case of ulcer peptic in character. This frequently marks the beginning of convalescence. In the case of carcinoma, the bleeding usually continues during treatment, or disappearing, begins upon the administration of food by mouth. This is given considerable importance by Hans Elsner in the differentiation of the two conditions.

Having narrowed the diagnosis to peptic ulcer, there yet remains the very important question of its location with relation to the pylorus. Boas states that "the differential diagnosis between gastric and duodenal ulcer is of more scientific than practical value." Nevertheless it is desirable, and of sufficient importance to occupy the remaining moments of this paper.

The typical duodenal ulcer pain comes on regularly, a long time after eating—three or four hours—also at night, with the presence of tar-colored stools without the accompanying vomiting of blood, and a constant pain to the right of the median line, which radiates to the sternum or the right flank. If the ulcer is located in the stomach, dyspeptic disturbances predominate, especially vomiting. In ulcer of the duodenum these disturbances and vomiting are rare. In ulcer of the stomach occult blood is found in the stomach contents and also in the stool. In ulcer of the duodenum, as Ewald has lately shown, one finds occult blood only in the stool in most cases, but unfortunately these apparently sharply drawn differential findings are not absolutely reliable, since in cases of known gastric origin, blood has been found in the stools and was not observed in the stomach contents. (Reported by Boas, Strauss, Kuttner.) Also in ulcer of the duodenum traces of blood sometimes occur in the stomach contents. Only where these symptoms agree can we diagnose duodenal ulcer positively.

Finally the relation of the pain to the taking of food plays a most important rôle in the differential diagnosis. The increase or decrease of the stomach secretions are not significant here, as hyperchlorhydria occurs not only in ulcer of the stomach, but in ulcer of the duodenum, and the alleged statement of Moynihan that recurring hyperchlorhydria is a medical term for a surgical condition, is without foundation.

The valid reasons for operation, I believe, are recognized to be: first, perforation; second, repeated intestinal hemorrhage; third, cicatricial stenosis of the duodenum, with or without gastric dilatation; fourth, a case that will not yield to treatment; fifth, recurring cholecystitis.

Macroscopic melena occurs, but much less frequently than occult blood. A mystifying situation may be cleared by the demonstration of occult blood in the stool. Earlier writers as Strauss and Oppenheimer observed bleeding only in one-third of their cases, but overlooked examination for occult blood. Ewald states that he has found occult blood present almost without exception. Melena, together with other signs pointing to duodenal ulcer, are pathognomonic only when there is no blood in the stomach contents. The passage of blood from the duodenal ulcer into the stomach with the absence of intestinal bleeding is certainly rare. Ewald has seen no such case. In some cases, first blood is vomited, then bile and blood. Of course one must eliminate disturbances of the lower bowel, especially hemorrhoids, which may produce bleeding.

It is estimated that vomiting occurs in duodenal ulcer only where cicatricial stricture or mechanical stenosis of the intestine exists, possibly 17 per cent. of cases. One of the characteristics of duodenal ulcer is that the pain is not relieved by vomiting. In gastric ulcer relief is immediate. If vomiting occurs in gastric ulcer, it is at the height of the pain.

The administration of artificial acids produces pain immediately in the case of gastric ulcer and in about three hours in duodenal ulcer. If the administration of food or alkalis gives relief, it is prompt in the case of gastric ulcer and in about two hours in the case of duodenal ulcer, in which case it acts reflexly, stimulating the bile and pancreatic juices.

Ewald states that dorsal points of tenderness occur, but irregularly. Boas, however, places some stress on this differentiation. The development of icterus, which cannot be otherwise explained, should suggest duodenal ulcer.

As support for doubtful cases duodenal ulcer occurs more often in men. Boas has attributed this to the use of alcohol.

The typical Roentgen findings in ulcer of the duodenum are hypertonia and rapid emptying of the stomach. The increased motility of the stomach depends on the reduction of the duodenal reflex. Through the accumulation of irritants there may be produced duodenal spasm with attending gastric stagnation.

By the use of lead markers on the abdomen over the seat of the pain and the localization of the underlying points with relation to the stomach as observed by means of Roentgenoscopy, the diagnosis may be made

The Einhorn bucket, apparently useless as such, does act as a sinker for the thread, the employment of which is upheld by some of the most careful observers. The last modification, the split shot, seems to conform to the anatomical discrepancies and personal peculiarities of the usual stomach better than the bucket. While deserving of further trial, its utility is doubtful. (I would suggest that by the use of the *x*-ray it is difficult to demonstrate that the lead has passed out through the pylorus.)

With these practical points firmly fixed in his mind, the painstaking clinician will sometimes be able to rescue a patient from impending danger.

DISCUSSION

Dr. Robert S. McCaughey, Hoopeston: Before considering the pathogenesis of peptic ulcer which I have been asked to discuss, I wish to emphasize the necessity of repeated examinations of the feces for occult bleeding in all cases of digestive disturbances. It happens frequently enough that duodenal ulcer causes only a slight amount of belching or maybe a slight discomfort after eating.

As to duodenal ulcer following burns, Power considers that it occurs only in those cases which suppurate. What are the pathogenic factors concerned in bringing about this localized area of necrosis known as peptic ulcer? A number of theories have been proposed of which several have been demonstrated by animal experiments which show that we are not dealing with a uniform process. Changes in the vessel walls, lessening the supply of blood to the parts have been demonstrated repeatedly as one factor. These artificial ulcers, however, heal more rapidly than the clinical variety.

Chronicity was produced experimentally when digestive activity was increased. Clinical observations speak for increased digestive action as a pathogenic factor, as ulceration of the jejunum after gastrojejunostomy. Peptic ulcer of the duodenum occurs most frequently where the acid stomach contents spurt against its walls. The normal gastric mucosa is resistant to hyperacidity. The Hunterian conception was that resistance to digestion lay in the "vital activity of the tissues." Today we say resistance depends upon a normal state of nutrition for which a normal quantity and quality of blood is necessary. Neumann said that gastric juice attacks only necrotic tissue. He went to the extreme. He did not recognize different degrees of nutrition. These two factors, disturbance of cell nutrition and increased digestive activity, are the most important. If the blood-supply to an area is absolutely cut off, necrosis follows through autolysis. No action of gastric juice is necessary. This is clinically illustrated by ulcer with achlorhydria. Hyperacidity becomes a pathogenic factor when the disturbance of local nutrition is relative. If hyperacidity is present, an ulcer will be formed if there is an area of disturbed nutrition, or we may say weakened resistance. Doubtless there are people who have areas of lessened nutrition in the stomach or bowel wall due to blood-vessel changes who do not have ulcer because they have never had an attack of hyperchlorhydria. They have a low acidity which compensates for the tissue disturbance. This is illustrated clinically frequently in patients after fifty; an age characterized, we may say, by blood-vessel changes, but because low acidity is the rule at this time of life, ulceration is not more frequent.

Changes in the quality of the blood may also disturb cell nutrition. This is experimentally demonstrated by injecting pyrogallol, pyridin, lead, arsenic, etc. In chlorosis, constriction of the vessel and intima changes are described. To this quantitative factor there is added a second factor, qualitative changes of the nourishment. We would expect ulcer as a frequent occurrence, especially so if a third factor is added, hyperacidity of the gastric juice present in 73 per cent. of all cases of chlorosis in Leube's clinic, and in 95 per cent. in Riegel's clinic. Therefore, besides the local disturbance of nutrition we may have a general source of nutritional disturbance as a pathogenic factor.

Innervation disturbances produce ulcer. Through resulting spasmodic or hypertonic contractures of the muscularis mucosæ, a local ischemia brings about a quantitative nutritional disturbance.

The mycotic origin of some ulcers is established by clinical observation and animal experiment. It is considered a relatively infrequent factor.

Katzenstein's results could not be obtained by Viola and Gaspardi. Quantitative determinations of antipepsin in Ortner's clinic in Innsbruck recently showed no reduction, and in a number of cases even an increase of antipepsin.

In all of these disease processes brought about by many etiologic factors there is one condition fulfilled, a disturbance of nutrition.

The question now arises, have we evidence that toxic substances are elaborated in the body which act directly on the epithelial cells without producing changes in the vessel walls? Payr produced typical ulcer of the stomach through intravascular injection of hot physiologic salt solution, dilute formalin and dilute alcohol without injury, according to Boas, of the circulation. With the hot salt solution there was certainly no disturbance of isotonia, certainly no toxic action, but a disturbance of nutrition by exclusion or great dilution of the blood to the parts. By the use of dilute formalin solution and dilute alcohol the same disturbance of concentration may have obtained or a direct toxic action upon the epithelial cells may have played a part.

Devic and Chavet, Perry and Shaw, together report 140 cases of ulcer of the duodenum in which twenty-four cases of Bright's disease occurred. Whether in these cases and in ulceration occurring in uremia, there are changes in vessel walls, we do not know. Too little attention has been given to the condition of the vessels of the stomach and bowel.

A bacterial toxin necrosis is admitted. As to intestinal and metabolic sources, there is no proof. Until we know something more definite in regard to these toxins, and those causing changes in the vessel walls, we will not know whether one or a class or many bodies are concerned.

EPILEPSY AND CRIME; THE COST

A REPORT FROM THE JUVENILE PSYCHOPATHIC INSTITUTE, CHICAGO

WILLIAM HEALY, M.D., DIRECTOR

The price which society pays for neglecting its epileptics has never half been told. The sorrow and cost of wasted and frequently vicious lives occurring as the result of this at present incurable disease has never been estimated. One most important part of the price paid can be learned through gaining knowledge of the connection between epilepsy and crime. To this end some of the hard facts of our own experience are worth reporting at this time.

To-day a fine type of immigrant mother brought her boy, and he will serve by way of illustration of the general problem. "It is not so much what he has done as what I am afraid he will do," she explained. Although guilty of a number of misdemeanors, there had never been police complaint against him until now, but steadily his tendency has been towards moral unreliability in spite of his mother's good efforts, and in spite of his affection for her. She never knows what this nice-looking, well-developed lad is going to do next. At times he seems absolutely uncontrolled, a creature of vicious impulses. His violence leads her sometimes to fear a tragedy in her home circle. At other times

he is kind and quiet and well-meaning. His variations from day to day are excessive, both mental and moral. All this, readily gathered from the boy and his mother, formed the typical history of a lad who for years had frequent convulsions, but who recently has had only momentary flittings of unconsciousness. As she foresaw, here was the making of a candidate for the criminal courts.

In the work of our Institute, which represents the most thoroughgoing research into the genetics of criminalism ever undertaken in this country, we have with the help of parents and others carefully studied nearly 1,000 young repeated offenders. We have found that no less than 7½ per cent. of these are certainly epileptics, and we have reason to suspect others.[1] If one remembers that it is ordinarily calculated that one person in every 500 is epileptic, the significance of this high criminal percentage is clear, and the practical bearing of it is still further accentuated by the fact that some of the worst repeaters are epileptics, and that many of the gravest crimes are committed by those unfortunates. The connection between epilepsy and crime has everywhere been recognized by students of the subject, but it apparently needs constant emphasis in order that common sense steps may be taken toward guardianship of these who suffer from a disease which wreaks such extravagant vengeance on society.

The progress of so many epileptics downward from dispensary clinic to prison has not been made a matter of general knowledge for the same reason that many of the main factors lying back of criminalism have not been brought to light. Continuation studies of special human types and of the results of special experiences have hardly begun. The fact is that if many clinicians could have the opportunity of knowing the moral end-results in the epileptic cases they have seen, they would find a considerable number of them in penal and reformatory institutions, or members of the vast crowd of tramps and city lodging-house bums.

Recently, in connection with court work, I saw a young man whom I had treated at the clinic ten years before. He comes from a very decent family, and had early in life very decent impulses, but with the progress of his disease he developed a typical mania for wandering, was willing to sleep on the roadside, stole mildly and took his pleasures as he found them — a big, hulking, soft-voiced fellow, quite rudderless in a world which offered no chances for him. During the interim he has served through one long reformatory term and several correctional sentences. In one city his mother found, while tracing his wanderings, that he had been picked up intoxicated, and on the supervention of a mentally clouded condition he had been sent temporarily to an institution for defectives. We found a farm home for him, but after a day's work he was off again. The possibility of this wanderer's further crimes and criminal trials and punishments then began burning themselves again in his mother's mind, and the outrageously weak part of the situation is

1. This by no means represents the total number of epileptics seen in connection with juvenile court work, where, of course, first offenders as well as large numbers of dependents are seen. In addition to my above enumeration, other cases seen by the Detention Home physicians and by myself amount up to many scores of cases.

that they should not be just as vividly foreseen by society, which has neither offered him a home nor protected itself against him.

This almost inevitable downward progress, which could be vividly depicted by a Hogarth, was fully appreciated by a young fellow who came into the Juvenile Court last year and boldly asked to be sent away for a long time to a reformatory or, if that was not possible, to the House of Correction. "I just see what's coming to me," said he, "I'm getting in wrong. They wouldn't have me in school and I hung around on the streets. And now they fire me at any job I get as soon as I have a fit. I'm bumming on the streets all the time, and you know who the fellows are there are to bum with. I see where I land all right, and I want to go there now before I get into trouble."

There are two main causes, easily perceived, which lead directly to the remarkable correlation between epilepsy and crime. One of them has been emphasized considerably by psychiatrists. It is the fact that the disease itself produces very frequently a characteristic, definite mental and moral deterioration shown most markedly in the field of social inhibitory powers. The social considerations which are paramount with most of us, and form the basis of most of our actions, are with them more or less dissolved or absent. Hence, the gross appetites, the cruel behavior and the vicious crimes.

The other cause is inherent in environmental conditions. The epileptic's very social inadequacies lead, as our boy said, to bad associations. Add this to his lessened powers of social resistance, and in many cases there is brought about a most deplorable result. The learning power for evil things possessed by a deteriorating epileptic is, I believe, almost unequalled. Some poor victims of this disease that one has come to know have been veritable sinks of iniquity. But after all, one may ask, why not? Their limited social opportunities offer little satisfaction under normal moral restraint, and they naturally follow a path of little resistance.

Instability in the moral sphere is readily found to be a prominent feature of epileptic offenders. They show great variations from day to day. They may commit the most surprising and unexpected crimes. To know the moral caliber of an epileptic to-day does not mean knowing it to-morrow. This, of course, is the result of variation in phases of the disease. Here is not the place to go into technical discussion of the automatic or twilight condition observable after convulsive attacks or taking their place — it is sufficient to say that these differ greatly in nature and incidence, but play only a minor part in the production of criminal behavior.

For the understanding of the whole subject by non-professional readers it should be emphasized that the types of epilepsy in which actual convulsions do not occur—the so-called minor epilepsies, where there are mere momentary losses of consciousness—are often accompanied by a greater amount of moral and mental deterioration and variation than are the cases of the major or convulsive type.

This variability is well shown in the instance of a boy whom we have often seen; a strapping lad who is a terrific problem on account of his frequent commission of offenses. At times the poor fellow is full of ambition and shows, indeed, normal ability. He particularly desires to be a professional man, a lawyer. In addition to his school work he has started law studies. And yet the first time I saw him he was in such a dazed condition for hours that he hardly knew his own name. He had been involved in a miserable affair which sent a degenerate man to prison for a long sentence. Sometimes he has been found full of vindictive spirit toward even his own relatives. At other times he has displayed much contrition at the offenses he has in his uncontrolled moments committed.

A terrible train wreck of a west-bound flyer was almost perpetrated, being narrowly averted through the discovery of the obstruction five minutes before the train was due at that point. The wreck was deliberately planned by our would-be lawyer under the spell of one of his whim-controlled states. He knowingly placed some angle irons in the best way to do the work, and then went about in the unfamiliar neighborhood, met some boys and invited them to come down soon and see a train tumble over. I repeatedly asked him why he did it, and all he could answer, while expressing deep regret, was that somehow he remembered he had just wanted to see what a wreck would look like. A few of his deeds have aged his mother a score of years, and have kept not a few policemen busy. But if met only in his better moments one would scout the possibility of his being the source of so much trouble.

The changeableness of the epileptic character leads not only to criminal incalculability, but also to the despair of those who would administer the law according to the canons of criminal responsibility. Clouston says, "Murder by an epileptic should be looked on as being as much a symptom of his disease as larceny by a paretic," but courts of appeal have decided that epilepsy is no excuse for misbehavior unless the given deed is done under the influence of an immediate seizure. I am inclined to think that, after all, unless we select the more humanitarian method and take care of our epileptic offenders permanently, the court's decision, psychologically so palpably absurd, offers in its scheme of retribution the wisest solution for the protection of the social well-being.

The range of offenses perpetrated by epileptics is extensive. The four-foot specimen of humanity, who was celebrated in the newspapers as the Champion Lost Boy of Chicago, formed an amusing but fairly costly spectacle at one end of the gamut. A hundred times, his people say, he has been away from home, and of course the police, by night or day, have had to struggle with the question of who he is and where he lives. More than once his playmates have wandered with him and parents have searched in vain. Such wandering speedily leads to worse things. One family loses its son and brother for weeks at a time, and perhaps he is found drunk in a barn, or perhaps he is discovered in the Bridewell.

At the other end of the range are those who commit desperate crimes, often of a cruel and degenerate type, showing insane impulsions. One of the worst murderers of recent years in Illinois, a killer of women, was an old epileptic. His trial and hanging cost thousands, and he was guilty of much more than he was tried for. The lurid annals of criminology are full of the dastardly deeds of epileptics.

The gravest sex offenders are often epileptic. The disease is compatible with a vigorous general physique, and not infrequently Nature has also thrown on these unfortunates the burden of a premature and excessive sex development. This, taken with their lack of power to control their natural appetites, makes them doubly a menace. We could give many instances of this and recount its results for society. I well remember one mother who came in highly indignant at the laxity of society in not taking care for its own sake of her 14-year-old boy. "What can be done for him under the law," she exclaimed. "I fear for my own sex."

And epileptic girls, showing mental deterioration, are to be regarded as, unless under the strictest safeguards, potential sex offenders. Our case histories reek with the failure of the ordinary home to prevent the moral downfall of epileptic daughters. Nothing is more shameless than the offering by these girls of their own persons. They, as well as the boys, sometimes develop early from the physical side and have an excess of sex instinct. The distribution of venereal disease from such neighborhood source can better be hinted at than here detailed.

One very great general cause of crime, not at all appreciated, is implicated in this situation of non-segregation of the epileptics. I refer to the fact that from an epileptic with vicious tendencies there is frequently an immense amount of social contagion. Not only are the epileptic easy learners of vice, but they are great spreaders of it. The very fact of their deterioration in the sphere of social and moral inhibitions causes them to be willing spreaders of evil knowledge, and, indeed, causes them to seek an outlet for their tendencies in evil teachings. These possibilities can well be imagined. We have seen many illustrations of the fact, running all the way from the instruction in miserable pervert sex practices to the teaching of skilful methods of thieving.

Another point not generally appreciated is that epileptics, as well as high grade feebleminded individuals, and some of the insane, exhibit a great deal of low cunning and skill. Why not; if the more healthy and normal avenues of gratification of self-expression are barred to them, why should they not seek the types of gratification at which they discover themselves most successful?

An eleven-year-old epileptic boy, weight 70 pounds, we first saw a couple of years ago when he was brought into court. The complaint was attacking little girls and injuring a boy. As is usual in the Juvenile Court there was good apprehension of the needs of the case, but there was not the slightest public facility for the care of him. He was tried in one public educational institution, but on the first appearance of his epileptic

tendencies, which were quite infrequent in the daytime, he was rejected. It was rightfully considered dangerous to keep him there. Both before then and since, for the same reason, he has been rejected from schools. A week ago this lad was once more presented in court, and with him were implicated four other little chaps, his disciples. The principal of the school in whose district this boy lives recounted this last time something of what he knows of the case. He stated that he could well calculate that this boy had already cost society $5,000, mainly through his teaching of others the fine arts of crime. I went over the case again and am inclined to believe these figures to be well within the truth. Notwithstanding his disease, he is smart in several ways, and particularly in his deftness in abstracting other people's belongings. He enjoys his performances thoroughly, and is a great teacher of others, taking smaller boys from the streets down town with him and showing them the tricks of his trade. Some score of boys are already known to have been involved with him, and enough of them have been sent away to public institutions as the result of his teaching to make the immediate cost of their up-keep for their first prescribed terms, together with many other expenses connected with the boy, a sum so far of at least $5,000.

Epileptics, of course, are not wanted in the ordinary schoolroom, they can not be tolerated in a business position, they are dangerous to themselves and to others in almost any factory or workshop, and they are not even wanted in reformatories. Perforce of their very disease they are not included among the reformable, and would interfere with the well-being of those who are. But yet if out of mere sympathy for their disease they are pardoned from a penal institution without other care being enforced upon them, a grievous injustice to the welfare of the state may be done. The miserable degenerate murderer above mentioned, the woman killer, had been during his youth pardoned, so his family stated, from a reformatory in a certain Eastern state by the governor because, forsooth, he was an epileptic. Now if there is any type of criminal that we can absolutely predicate to be a menace when pardoned and at large, it is the epileptic criminal.

There is altogether too little understanding of the main factors which lie back of criminal conduct. There are many reasons for this. Information given to the public through the newspapers rarely consists in anything else except the exploitation of the details of the crime and its immediate antecedents. Only occasionally do we ever note an attempt to present an estimate of what the make-up of the individual is who has perpetrated the offense. The newspapers and the reporters are not interested in the ultimate causes, and so the public does not get educated on these points. It is only occasionally, as in the case of a Chicago murder last year, where one may see even an allusion to the fact that the offender, who in this case decapitated a young playmate, was an epileptic. In all the times that our champion lost boy was mentioned in the papers nothing was ever, to my knowledge, said about the disease which was in the background of his delinquency.

Nor has the matter of causation become a part of the understanding of criminalism as reflected in ordinary legal procedure. But as I suggested above, perhaps it is best so unless the attempt is made to stem the tide of criminality somewhere near its sources.

How little can be done about the matter of protecting the public under even the parental provisions of the juvenile law unless there are adequate facilities for the care of epileptics by the state is shown in the experience of our own court. There the impending danger is recognized by a wise and sympathetic judge, but all to little purpose.* Our experience shows that under the jury method in vogue there is little chance of an epileptic being considered insane. Of course, he may show not the slightest signs of insanity at the particular time he is under observation. And then when even going voluntarily into a hospital for the insane there is encountered at once the decision on the part of the superintending physicians that such a hospital is not the proper place for an epileptic who is not considerably demented, and of course they are right. The individual soon comes out into the world again and, as we have only too often seen, recommences his undesirable behavior.

The total cost of even our own group of repeated offenders we should not dare to estimate — calculations of criminal costs are extremely difficult to make with accuracy. The above estimate of a single case indicates something of the size of the problem. The yearly cost to a state like Illinois is immense. So far as numbers are concerned our own data show the development in dozens of cases of young epileptics into the most reckless criminals, hold-up men, "gun toters," and degenerate offenders of all kinds.

The non-segregation of epileptics (in spite, here in Illinois, of many previous professional appeals to legislators) is utterly uneconomical, unsympathetic and in general significant of a partially civilized state of social consciousness. The tears of afflicted mothers, the heart breaking discouragements of the epileptics themselves when they are not too far gone to care, and the vast costs and injuries actually endured by society on account of crimes and vices committed by epileptics, all cry out against such wanton neglect.

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* Judge Merritt W. Pinckney has repeatedly in addresses, in communications to the newspapers and in his testimony before the County Civil Service Commission, called attention to the terrific social necessities concerning epileptics encountered in the Juvenile Court. At the latter time, when asked to state the reforms necessary in the Juvenile Court, he said: "First, provision should be made for the care of the epileptics who come into my court, sometimes as many as three or five in a week. . . . These epileptics are turned loose on the street. Epileptic girls, at an age when they become delinquent, are susceptible to influences that other girls with mental capacity and strength of character can resist; but they fall, and you force the court to turn them loose to go back to the red-light district. Epileptic girls who are delinquent are a positive menace to society. . . ."

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FEBRUARY, 1913

THE PANAMA EXCURSION

We are pleased to announce that arrangements for the Panama excursion have been perfected in such a way that it will be perfectly satisfactory to every member of the State Society who contemplates the excursion.

Instead of assembling at St. Louis and losing a day's time, arrangements have been made by which those from the northern part of the state can take the Illinois Central Seminole Limited out of Chicago at 8:15 Saturday evening, March 1, and those from the southern part of the state take the same train out of St. Louis at 11:20 P. M. The trains will be consolidated at Vandalia, and run a special from that point directly through to Jacksonville. This train will reach Jacksonville at 7:30, Monday morning. There will be time to look around that city until afternoon, and the remainder of the trip to Key West over the sea-going road will be made in time to reach Key West for the splendid steamer *Evangeline*, which carries no freight, and makes the trip to Panama in three days.

Every obstacle being now removed, we are sure that no less than 200 physicians of the society and their friends will go on this excursion, which certainly will be a delightful one. Rate from Chicago for round-trip, $244, and from St. Louis, $239.

DRIVE OUT THE FRAUDS

From Monmouth, Macomb and Carrollton, we learn that a certain imposter calling himself Dr. Schiller, who uses the prayer and laying on of hands game for swindling the people, has visited these towns, and in at least two of them has run afoul of the law for practicing without a license, and obtaining money under false pretenses. His coming should be watched for in every town in the state, and complaint made of his fraudulent practices and disgraceful travesty of religious methods before he gets started to swindling the gullible public.

We learn that at Carrollton a good many patients were treated by him at the Pearson Hotel on January 21, and on the 22d charges were filed against him. The previous week he was in Macomb, and the *Journal* of that city gives the following account of his success and the steps that were taken to make him move:

> Mr. Schiller, who claims to heal by the aid of prayer and laying on of hands, was here Friday, and as a result of his advertising methods the Williams House was crowded all day with patients. Some of those who were treated early stated that they had been swindled and went to Chief of Police Pudum and he and the two police went to the hotel. Those treated said he charged from $1.00 to $10.00 for a treatment, wherein he had advertised free treatments.
>
> When the police arrived, they found the waiting room full of those who wanted treatment, there being great numbers present from the city and up and down the railroad, attracted by the advertising. The chief called the doctor to one side and told him that some who had been treated had complained to him, claiming they were swindled. He asked the doctor if he was within the law in his practice, and he said that he was. He told him then to go out before those assembled and tell them that some had complained about his treatment, and thus warn them, so if they took the treatment they would have no cause to complain. This he did, and he also told those who were in the room to let the patients from outside the city be treated first, and he could wait on the local patients later. He did a big business, his office being crowded all day.

IRREGULARS IN DIRECTORIES

Irregular practitioners in all parts of the state seem to be constantly endeavoring to crawl under the tent, and take their seats as registered physicians before the public. One favorite method is to be listed among physicians in the city and telephone directories. In the Springfield Directory classified as physicians are osteopaths, cancer specialists, advertising specialists and the Viavi Cure.

In Peoria we understand, in addition to the above, faith healers are listed as well as several persons who have no medical title of any sort. We have no information from other localities, but undoubtedly a similar state of affairs exists in nearly every one of the cities in the state.

The city and county societies in every place should take this up with the directory printer, and insist on placing these practitioners where they belong, and not under the list of physicians. We understand that where this matter has been brought to the attention of the companies, they have been very glad to right the wrong.

QUACK DOCTORS AND THEIR DEPREDATIONS

One M. J. Kraus, who assumed the name of "phenomenal" during his residence in Peoria, has come to grief in Los Angeles, Cal. During his stay in the Illinois city, Kraus gave a show at the old tabernacle on Globe Street, and while there sold thousands of bottles of his patent medicine. It is said he was known as a degenerate while there, and the account of his escapade in the city of Angels surprised no one. Kraus has operated in a number of eastern cities, including Cincinnati, and notwithstanding his outrageous pretensions and bombastics, it seems, was successful in swindling numerous people. Owing to the belief that he is mentally unbalanced, he was delivered to the custody of his brother, who has promised to care for him.

Another irregular practitioner was recently arrested on statutory charge in Springfield, and will probably be brought to trial in the near future.

THE SMALL-POX SITUATION

As has long been expected, the time has arrived when an epidemic of small-pox is due in Illinois. The present generation has not remembered the lessons of former disastrous epidemics, and the use of vaccine virus has for many years been neglected by the profession. Christian Science and New Thought devotees have worked up a sentiment against the compulsory vaccination of school children, and all things taken together have conspired to give full sweep to the invasion of the dreaded scourge.

It is not necessary, of course, for us to point out the disastrous effects which are likely to result from present conditions. We sincerely believe that this prejudice against vaccination would not prevail if there existed in Illinois a State Board of Health worthy of the name and having the confidence and support of the medical profession and the lay press.

HOW HE SELECTED A DOCTOR

A woman living in a down-town street was ill with sore throat. She had not been ill for years and had no regular physician, so her husband set out to look for one. Their son, a lad about 10 years old, went along as guide. Half way down the block they came to a house whose front door was decorated with a doctor's sign.

"Here is one," said the boy, and started up the steps. But the man stopped him. "Wait a minute," he said. Then he leaned against the railing and stared up at the windows of the doctor's office. "I don't want him," he said presently. They went on. Soon they came to another sign. "Here is another," said the boy. Again the man looked intently at the front windows. "No," said he, "he won't do, either." They went to two more places in that street, and to one in the next street before finding a house where the man would consent to apply for medical aid. Naturally, the boy wondered, and finally he asked his father why he left the other houses without going in.

"I wouldn't go into those places," said the man, "because the windows were dirty, and I never saw a doctor who lived in a house whose windows were dirty that was worth his salt."

THE APPLE

How dear to my heart are the scenes of my childhood,
When fond recollection presents them to view;
The *Orchard*, the meadow, the deep tangled wild-wood,
And every loved spot which my infancy knew.
The gold cheeked apple,
The ruby red apple,
The sweet tasting apple,
That hung on the tree.

Modern science has condemned the song describing the *Old Oaken Bucket*, of which the above stanza is a metaphrase, as a menace to health, but the delicious apple so dear to the active boy remains as one of Nature's best provisions, in the way of fruit, for the use of mankind. What risks of dogs and guns venturesome boys have taken for the prospect of burying their teeth in the forbidden fruit. If we can believe Biblical tradition, it was the desire for the apple which caused the downfall of Eve. Much has been written recently regarding the value of the banana as a food, but we are old-fashioned enough to believe that no article of diet in use in the temperate zone is so grateful and beneficial as the apple.

In the beginning of the last century, a simple-minded man from Pennsylvania passed through the western country, distributing choice varieties of apple seeds, and was known only by the name of Johnny Appleseed. This person probably did more good for the early inhabitants than many a more pretentious individual, and while his labors were scarcely rewarded during his life the memory of his good works remains.

The full value of the apple was not appreciated until a few years ago, when there was almost a complete failure of the crop in the middle states, and the poor were unable to purchase the high-priced product coming from the far Nothwestern states, which have been found to have a soil and climate especially adapted for apple culture. Some of this Northwestern fruit is selling even now at a higher price than the orange of California or Florida, and really the fruit is more nourishing than the tropical product. Made into pies or sauce, baked or eaten raw, the apple is grateful and acceptable to most palates, and of a distinct medical virtue when it comes to the treatment of constipation. For this latter purpose it should not be pared. An old servant of our family who had lost her teeth by salivation, was able to partake of the raw apple by scraping it with a heavy spoon. Where the apple is eaten there can be no scurvy.

The value of apple cider and apple vinegar should not be forgotten. It is said that the "jag" obtained by the over-indulgence in "hard cider" is one of the worst obtainable.

In these days of fads it is important that we do not neglect the old-fashioned fruit, and instead of running after something new, learn to improve the flavor of the apple; urge that the farm orchard be kept up, and the use of the delicious apple be encouraged in every household.

NOTICE OF FEDERATION OF STATE MEDICAL BOARDS

The Federation of State Medical Boards will hold its annual meeting at the Congress Hotel, Chicago, on Tuesday, February 25, 1913.

Essayists, eminently qualified, will prepare papers on the following subjects:

"Is Universal Reciprocity to be Desired?"

"Should Medical Boards Require One or More Years of College Work Preliminary to the Study of Medicine?"

"Should One or More Years in a Hospital be Required for Admission to the Examination for Medical Licensure?"

"Rules and Regulations Governing Examinations for Medical Licensure."

"Qualification of Examiners."

"What Fee Should be Required for the Examination?"

"Benefit of Having a Single Federation of State Medical Boards and Method of State Board Record Keeping."

"Means of Keeping Politics out of State Board Affairs."

These topics are all of practical and vital interest to medical colleges, medical examining boards, the profession at large and the public.

Those contributing the papers on these subjects come with years of experience, and no medical board can afford not to be represented. An earnest and cordial invitation to this meeting is extended to all members of state medical examining and licensing boards, teachers in medical schools, colleges and universities; delegates to the Council on Medical Education of the A. M. A., to the Association of American Medical Colleges and to all others interested in securing the best results in medical education and legislation.

The officers of the Federation are Arthur B. Brown, M.D., President, New Orleans; George H. Matson, M.D., Secretary-Treasurer, Columbus (State House), Ohio; James A. Duncan, M.D., Chairman Executive Committee, Toledo.

THE CANCER PROBLEM. IS IT BEING SOLVED?

The cancer problem is of course recognized as the one great mystery which has not been solved by medical scientists. The number of institutions and men working to solve the riddle is, however, very large, and there are indications that possibly some advance has been made. One of those who seems to be approaching a solution of this riddle is Professor

Fichera, of Rome, whose work was described, in brief, at Dr. Murphy's Clinics recently by Professor Bastianelli, of Rome. As this subject is of great interest, with the consent of W. B. Saunders Company, publishers of Murphy's *Clinics*, we give the main part of the remarks made by Professor Bastianelli:

I will speak especially of the work of Professor Fichera, the young man in Rome, who has devoted much of his life to the investigation of carcinoma. What is the origin of carcinoma? We do not know.

Professor Fichera has carried on a series of investigations for the purpose of studying how embryonal tissue grows when implanted into rats. If you implant embryonic tissue into rats, it grows for a while, but after a certain time the tissue is destroyed completely. There is no possibility of producing experimentally a tumor by injecting embryonic tissue into a living animal, but it is possible to make the grafts grow for a certain length of time or to make them grow less rapidly or to prevent or stop their growth in changing some conditions of the experiment.

For instance: In animals previously grafted the new graftings are less and less apt to grow. It seems as though the animal had acquired an immunity against the embryonal tissue. This was proved not to be due to antibodies in the blood-serum. During the involution of the first grafting it was impossible to see that the cells died through dissolution or autocytolysis, and it was thought that this process was providing the organism with substances capable of having an elective action on the cells of the new graft. In fact, preparing a liquid by leaving for a certain time aseptically embryonic tissue in salt solution, that is, in making an autolysis or dissolution of this tissue and then injecting it into rats successfully inoculated and having grafts in full growths, it was possible to see these grafts disappear completely. From that came the idea of trying the same in rats grafted with the so-called spontaneous cancer, which, biologically, runs in many ways similar to the embryonic tissue grafting. The results were identical, and it was possible to stop and to cure animals having big growths which would have ended fatally, but not to immunize them against a tumor graft. The ulterior investigations of the factors which may favor or change the conditions of growth of embryonic tissue or tumor grafts have proved that these factors must be looked for in nutritive and formative substances produced by organs or glands of the body. Some of them favor the growth and they may be called oncogenic—that is, having the property of stimulating tissue to grow. Some act on the contrary—that is, they stop or destroy the tumor—and may be called oncolytic. The factors must be normally present in the body and regulate the normal growth, but occasionally the production of one or the other may be disturbed. It even may happen that a change in their mutual relations takes place, so that some cells or groups of cells already disturbed in their functions may be stimulated and pushed to an abnormal proliferation or not checked in their disordinate proliferation.

The embryonic cell is the one which more easily responds to biochemic actions. In our body are found groups of embryonic cells or tissues scattered in some organ. On the other side, it may be that groups of normal cells displaced by traumas or stimulated by repeated irritation are put in an abnormal reproductive condition which is very near to that of the embryonic stage. It is easy to think that these cells will feel more deeply the influence of any perturbation in the proportion between the oncogenic and oncolytic factors, and begin to grow without any possibility for the body to stop their progress. A close and systematic investigation of these organs and glands, which seem to have a greater influence on the growth of embryonic tissue and of experimental tumors, has demonstrated that the spleen and the genital glands act in opposite direction.

If you remove the spleen of an animal and then inoculate embryonic tissue, you see that the tumor grows much quicker, and in a greater percentage the graft takes place. If you remove the testicle instead, you will notice that there

is either a complete check in the graft, or it does not grow as well as it grew formerly; and on the other side, the injection of autolyzed spleen stops a prosperous growth, while that of an ovary makes it develop quicker.

From these investigations there have been therapeutic principles established. If you autolyze spleen or embryonic tissue and inject it into the system, you may give to the organism the autolytic property which it has lost. That has been found to be very effectively accomplished either by autolysis of embryonic tissue or by autolysis of spleen tissue. Applying these principles to rat and mice cancers—experimental cancers—they have proved most effective. I may say to the physicians present that we can check the growth of cancer in a mouse or in a rat by injection of the autolytic tissue of the spleen or of embryonic tissue, but as far as man is concerned I cannot tell you anything definite in the way of results. I know of some cases in which the results were favorable, and in one at least is satisfactory so far, but the time that has elapsed is too short, and it will require a great deal more experience before reaching a definite conclusion. This case was one of abdominal removal of the uterus and ovary for cancer in a patient in whom the disease was rather advanced. This is just an experiment in a woman to be compared to experiments in animals—that is, the removal of the tumor, plus the removal of the genital glands. In removing the genital glands you remove one of the oncogenetic factors of the tumor, and adding to the organism the autolytic property of embryonic or spleen tissue, you add the constitutional conditions or oncolytic factors that have been lost. This case was seen by myself when presented to the Royal Academy of Rome. The woman made a fair recovery from a rather extensive recurrence involving the vaginal scar and a part of the parametrium.

As to the outlook in the future of these investigations, Professor Fichera thinks that possibly some day we may find the autolytic properties of our organism which defend us against the invasion of tumors, and we may perhaps find the way to utilize them from a therapeutic point of view.

The preparation of the homogeneous autolysates used by Professor Fichera is given in the January 18th issue of the *Journal A. M. A.*

The homogeneous fetal autolysates is prepared by ordinary methods, under the strictest rules of asepsis. The fragments of the fetus are placed in about twenty parts of a physiologic salt solution, a suitable quantity of thymol or phenol being added, and covered by a layer of sterilized oil or toluol. The mixture remains in the incubator at 37 C. for about two months, and prior to use its sterility is tested.

The injections vary in dose from 2 to 3 c.c. twice to four times a week, according to the patient's age, condition, individual tolerance, the bulk of the tumor, the seat of the injection, and the specific gravity of the autolysates; the latter ought to be, at the moment of their employment, a homogeneous emulsion, and not a clear superjacent mixture. The treatment extends to a variable number of months, according to the local and general condition.

Correspondence

WOODFORD COUNTY MEDICAL SOCIETY NEW ADVOCATE MEDICAL DEPARTMENT STATE UNIVERSITY

To the Editor:—To the Governor and Members of the Senate and House of Representatives of the State of Illinois:

We, the undersigned physicians of Woodford County, Illinois, respectfully request you to carefully consider the establishment of a medical

department of the state university. Only large cities can furnish the proper clinics for a medical school, and Chicago is the ideal place for one of the great medical centers of the world. We beg leave to suggest that the state purchase the small and poorly equipped schools of this city and, after investigating the leading schools at home and abroad, organize a first-class, modern institution at Chicago. We also desire to state that in our judgment the location of this department or any portion of it at Urbana would be detrimental to the best interests of medical science.

C. B. HIGBY, Eureka, Ill., President Woodford Co. Medical Society.
J. F. PAGE, Eureka, Ill.
F. W. NICKEL, Eureka, Ill.
C. F. BANTA, Eureka, Ill.
N. B. CRAWFORD, Eureka, Ill.
C. B. HEINTZMANN, Metamora, Ill.
JOS. I. KNOBLAUCH, Metamora, Ill.
E. R. MCBROOM, Lowpoint, Ill.
F. B. IRELAND, Washburn, Ill.
B. N. WATT, Washburn, Ill.
JAMES TWEDDALE, Washburn, Ill.
FERD. SEIDL, Benson, Ill.
MATTHEW EVERTZ, Benson, Ill.
H. A. MILLARD, Minonk, Ill., Secretary Woodford Co. Medical Society.
WINFIELD S. MORRISON, Minonk, Ill.
PERRY M. EVANS, Minonk, Ill.
F. W. WILCOX, Minonk, Ill.
F. C. NICKOLS, El Paso, Ill.
F. H. HENDERSON, El Paso, Ill.
R. E. GORDON, El Paso, Ill.
M. V. GUNN, El Paso, Ill.
L. E. BRATT, Roanoke, Ill.
F. E. BRIGGS, Roanoke, Ill.
S. H. RUTLEDGE, Roanoke, Ill.
H. G. EICHHORN, Spring Bay, Ill.
F. E. NAGEL, Secor, Ill.

THE WELLTMER FRAUD

ROBERTS, ILL., Jan. 23, 1913.

To the Editor:—Can you give me any information regarding an institution in Nevada, Mo., by the name of Welltmer's Institute of Psychotherapy? Is it not listed as a medical fraud?

Thanking you in advance for information, I am,

Yours very truly,

J. A. COLTEAUX, M.D.

Dr. Colteaux is correct in his belief that the Welltmer Institute of Missouri has been listed as a fraud, and we understand that delivery of mail is prohibited to this institution by the United States authorities.

COUNTY AND DISTRICT SOCIETIES

ADAMS COUNTY

The Adams County Medical Society met in regular session, on Monday, Jan. 13, 1913. In the absence of the president and first vice-president, the meeting was called to order by second vice-president, Dr. C. R. Bates. Among the communications read, was one from Dr. Harold N. Moyer, in reference to the Defense Fund of the State Society. This was the subject of much discussion.

Dr. Christie made a motion, seconded by Dr. Ericson, that this society declare itself in sympathy with the objects of the letter. Carried.

Dr. Center amended this motion with the substitute motion that the secretary be instructed to inform the medico-legal committee, that the Adams County Medical Society is in favor of the Illinois State Medical Society, through its defense committee, carrying on this work, and working out an equitable indemnity plan. Carried.

Dr. F. B. Parker was elected to membership. A membership application was read from Dr. Everett W. Sykes. Luncheon was enjoyed at the Hotel Quincy.

In the afternoon Dr. H. T. Duffield, of Pittsfield, secretary of the Pike County Medical Society, addressed the society on "How to Resuscitate the New-Born Child." The talk was practical, interesting and instructive. The method described is original and this makes it of more value. The Doctor was given a rising vote of thanks for his excellent paper and an apology for the small number present. Our members are very busy at present and have no time to attend meetings.

ALEXANDER COUNTY

The Alexander County Medical Society held its regular monthly and annual business meeting at the Commercial Club Rooms, in Cairo, December 19. A majority of the members of the society attended. Under clinical cases, Dr. G. H. McNemer presented the history of luetic affection of the stomach in a man 35 years of age. The patient had done well on one intravenous injection of salvarsan. The doctor stated that he had recently investigated the question of whether or not syphilographers were abandoning the use of salvarsan and had found they were not. The case and the salvarsan treatment of syphilis were discussed by Drs. Dodds, McManus and Bondurant, who presented a case in which this affection was secondary to a trouble of the antrum. He had relieved the tension by a posterior sclerotomy about two weeks previous, and the vision had risen from absolute blindness to 20/80.

Dr. Dunn presented the subject of glaucoma in a general way original with himself, and several cases taken from his records to illustrate the various kinds and causes of glaucoma. He also gave a history of a typical case of primary inflammatory glaucoma with a typical history of prodromes that he then had in charge.

The officers of the society made their annual report. The secretary-treasurer's report showed that two-thirds of the eligible physicians of the county were members of the state and county societies, and 25 per cent. members of the A. M. A. The society was free of indebtedness and had a small cash balance in the treasury. There were eleven monthly meetings during the year.

Drs. C. P. Spann of Thebes, and O. M. Dickerson, of Miller City, were received into membership.

The secretary read a letter to the society showing that Dr. J. B. Murphy, ex-president of the A. M. A., had accepted an invitation to deliver a public health lecture in Cairo, February 5, under the joint auspices of the Cairo Woman's Club and the County Medical Society.

The society elected the following officers for 1913: president, Dr. J. B. Hibbitts (reelected); vice-president, Dr. Flint Bondurant (reelected); secretary-treasurer, Dr. Jas. W. Dunn (reelected); delegate, Dr. S. B. Cary; alternate, Dr. G. H. McNemer; member board of censors, Dr. W. F. Grinstead, all of Cairo.

The president deferred the matter of appointing the committee on public health and legislation to a future date.

Dr. Dodds called attention to the good work that the Department of Agriculture of the State University, the State and County Farmer's Institute, the Department of Household Science, The Educational Propaganda for Good Roads, etc., were doing. He introduced resolutions endorsing this work which were adopted by the society. The society then adjourned to the luncheon table.

BOND COUNTY

The Bond County Medical Society held its annual meeting in Greenville, Jan. 9, 1913, when the following officers were elected: president, Dr. H. D. Cartmell, Greenville; vice-president, Dr. O. C. Church, Woburn; secretary-treasurer, Dr. E. S. Clark, Greenville; board of censors, Drs. E. A. Glasgow, Mulberry Grove; A. M. Keith, Greenville; J. C. Wilson, Greenville.

The next meeting will be held at Greenville in April. In June Bond County will join with Fayette County in a picnic meeting, later on an autumn meeting, and then the annual meeting in December.

BOONE COUNTY.

The quarterly meeting of the Boone County Medical Society was held Tuesday evening, Jan. 14, 1913, at Belvidere, Dr. R. B. Andrews presiding. The following officers were elected: president, Dr. W. G. Hawkey; vice-president, Dr. Alden Alguire; secretary-treasurer, Dr. H. E. Delavergne; censor, Dr. George Markley—to fill out the term of Dr. Herbert, who has removed from the county; censor for three years, Dr. R. B. Andrews; delegate, Dr. A. J. Markley. The committees are to be appointed by the new president.

Resolutions of respect and condolence in view of the demise of Mrs. Butterfield, wife of Dr. Willis Butterfield, a member of the society, were adopted.

CHAMPAIGN COUNTY

The annual meeting of this society was held December 28, with twenty-eight members present. The following officers were elected: president, Dr. C. D. Gulick, Urbana; vice-president, Dr. T. J. Exton, Urbana; secretary-treasurer, Dr. Jennie Lyons, Champaign; board of censors, Drs. W. L. Gray and G. W. Rice, Champaign; Dr. J. S. Mason, Urbana; delegate, Dr. A. S. Wall, Champaign; alternate, Dr. T. J. McKinney, Gifford; medical defense, Dr. W. F. Burres, Urbana.

CHRISTIAN COUNTY

At the meeting of the Christian County Medical Society, Jan. 16, 1913, Dr. L. H. A. Nickerson, president of the state society, and Dr. Lewis Wine Bremerman of Chicago were present. Dr. Nickerson read a splendid paper on "Lobar or Croupous Pneumonia," and the paper was freely discussed by several of the members present, but the field was so well covered that little comment aside from commendation of the paper was heard.

Dr. Bremerman's paper was on "More Practical Things in Genito-Urinary Diagnosis from the Standpoint of the General Practitioner." This paper was also very much appreciated and was a most worthy effort on the part of the author. The discussion was not so free on this paper but the demonstration of the use of the cystoscope was of great interest to all present.

Dr. Bremerman also spoke at night at a public health meeting. The night was very bad as the rain poured down but the audience was a good one and from the comments I have heard I think it was highly appreciated.

The list of newly elected officers is as follows: President, Dr. D. K. Cornell, Taylorville; vice-president, Dr. G. L. Armstrong, Taylorville; secretary-treasurer, Dr. D. D. Barr, Taylorville; delegate, Dr. G. L. Armstrong (elected last year); alternate, Dr. T. A. Lawler (elected last year); both of Taylorville; legal committeeman, Dr. J. N. Nelms, Taylorville; public health committeeman, Dr. J. P. Simpson, Palmer; censors, Drs. Armstrong, Carroll and Nelms, all of Taylorville. There were three members elected and we will probably have others soon.

D. D. BARR, Secretary-Treasurer.

CLARK COUNTY

The Clark County Medical Society met, December 18, in the office of Dr. Wilhoit, at Martinsville, Ill. Members present were: Drs. S. C. Bradley, Bruce, Johnson, Boyd, Wilhoit, Weir, Rowland, and Lewis. Dr. Doak was a visitor.

Dr. R. B. Boyd read a paper on "Diseases of the Lungs," discussing bronchopneumonia in detail, etiology, symptomatology, pathology and treatment; then he took up lobar pneumonia in the same manner. Many important points were made on this very timely subject. All participated in the discussion. From the observations, experiences and opinions presented, each doctor was able to get many valuable points, helpful in the management and treatment of this very frequent and fatal class of disease.

COOK COUNTY

CHICAGO MEDICAL SOCIETY

Regular Meeting, Nov. 13, 1912

A regular meeting was held, Nov. 13, 1912, with the following program:

1. "Bronchial Asthma." Joseph M. Patton.
2. "Commonly Overlooked Factors in the Management of Heart Cases." Charles Spencer Williamson.

Regular Meeting, Nov. 20, 1912

A regular meeting was held, Nov. 20, 1912, with the following program:

1. "Exhibition of Patients." Truman W. Brophy.
2. "The Wertheim Extended Abdominal Radical Operation for Cancer of the Uterus." (By invitation.) Prof. William Wiebel, Vienna.

EXHIBIT OF PATIENTS

TRUMAN W. BROPHY, M.D., D.D.S.

Mr. President and Gentlemen of the Society: The first patient I exhibit to you is a woman, aged 35 years, for whom I removed a section of the mandible from the cuspid tooth to the glenoid fossa, for the removal of a tumor. This operation was performed intraorally.

The bone was divided just posterior to the cuspid tooth by the use of a saw revolved by a surgical engine. The incision was made along the anterior border of the ramus, down to the body and forward to the cuspid tooth.

The soft parts were removed from the surface of the bone nearly up to the coronoid process, when the bone was seized by strong forceps and drawn downwards and twisted until it was separated from the glenoid fossa and removed.

Immediately, the space occupied by the bone was packed. Forty-eight hours later the packing was renewed. The fourth day, the packing was again removed and the cavity filled with wax. At the same time the lower teeth of the opposite side were firmly wired to the teeth of the upper jaw.

The tissues surrounding the wax were kept clean by careful irrigation, and the bone held quietly in place, extending over a period of five weeks. At fre-

quent intervals this wax was shaved down. In the meantime granulation was filling the cavity.

The object in using the wax was to prevent the immediate contraction of the parts and consequent shrinkage and depression of that side of the face.

The wiring of the teeth together held the remaining part of the mandible in its correct position until cicatrization was complete upon the side from which the bone was removed. When cicatrization was completed, with the mandible in its proper place, normal occlusion of the teeth of the remaining portion of the mandible with the teeth of the upper jaw was maintained, enabling patient to properly masticate food.

Without providing means to prevent the extreme contraction of the face following the removal of a large section of the mandible, especially when disarticulated at the glenoid fossa, and without fixing the teeth of the remaining portion of the mandible to the upper jaw, a great deformity follows. The symphysis is diverted towards the side from which the bone has been removed, shrinkage of the face occurs, and by traction of the muscles, the remaining portion of the mandible is so far removed from its normal position that occlusion of the teeth and further mastication of the food is impossible.

By pursuing the course that we did with this patient, the following results have been obtained:

First: A scar has not been made upon the side of the face for the removal of the diseased bone.

Second: There has been no perceptible shrinkage of the face, since the wax held it in position during the development of new tissue to occupy the space left by the removal of the bone.

Third: The occlusion of the teeth of the remaining portion of the mandible with the teeth of the upper jaw is normal, and mastication is not interfered with.

Fourth: The facial contour and expression has undergone no marked change.

The second patient, a man aged 64 years, came to me in 1908, suffering from a swelling of the right side of the mandible, in the region of the second molar tooth, which was loose and about which there was a copious flow of pus.

On examination I found the lingual surface of the bone denuded and discovered the presence of exuberant granulations. He was under my observation a short time when after a microscopical examination of a section of the tissue, carcinoma was found to have developed.

The next step taken was to remove all of the diseased tissue. You will observe no external incision made here to expose the bone. An incision was made within the mouth, extending from ramus to ramus. The bone was thus exposed to view, carrying the entire body of the bone out of the mouth.

The entire body of the bone was taken away except a thin rim which forms its lower border. Then it was replaced within the mouth and frequently irrigated. The wound healed kindly and the patient made a good recovery.

Subsequently, however, it was necessary to remove an area of diseased tissue in the soft parts; and still later, about one year subsequent to the first operation, he had the misfortune to be thrown from a wagon, sustaining a compound fracture of the bone.

This gave us a great deal of trouble, but finally the wound healed, and there has been no tendency towards recurrence of the growth in the past two years.

Prior to the beginning of the disease, he weighed 200 lbs. When we operated, he weighed 135 pounds. At the present time he weighs 210 pounds, his appetite is good, and he is now in excellent health.

A surgeon of excellent repute proposed to remove the entire mandible for this man, a surgical procedure which necessarily leaves an irreparable deformity; but the successful management of this case demonstrates quite clearly that carcinoma of the mandible may be successfully treated without making external incisions for its removal, and without removing the entire bone.

It is true, sufficient time has not elapsed to insure against recurrence of the disease, but the healthy condition of the parts and the patient's return to perfect health and vigor, strongly indicate that the growth will not recur.

The third patient is a woman, aged 35 years, for whom an operation was made for the removal of carcinoma of the parotid gland, together with a section of the mandible from the second bicuspid tooth to the glenoid fossa.

The feature of this operation to which I especially want to call your attention is that we have succeeded in removing this gland entire without division of the seventh or facial nerve, and by so doing, we have not caused facial paralysis.

This operation was performed by first exposing and ligating the external carotid artery, second, exposing the facial nerve, carefully dissecting it out with blunt instruments, and then removing the gland together with the portion of the mandible.

The incision, in exposing this gland, was made in the shadow line, posterior to the ramus and beneath the lower border of the mandible. The tissues were reflected upwards, the bone and gland thus exposed, and removed.

The patient made a good recovery and perfect motion of the face has been preserved.

The result in this case demonstrates that surgical teachings, viz., that the removal of the parotid gland is followed by facial paralysis, are not well founded. I do not find in the literature of the surgery of this operation, any other statement than that it is followed by facial paralysis.

Following the removal of the bone, the traction of the remaining part of the mandible draws the lower teeth out of occlusion with the upper ones. To overcome this defect, the wiring of the teeth of the lower jaw to the teeth of the upper is necessary, as in the case first described to you.

These teeth should be kept in occlusion until cicatrization is completed on the side from which the bone was removed, when we may expect normal occlusion to be maintained upon this side.

A front view of this patient exhibits no mark following operation. I regard it very important when an external incision is unavoidable, to make it in the shadow line of the face, and reflect the tissues upward to expose the diseased tissues. The deformity of extensive scars of the face may thus be avoided.

Regular Meeting, Nov. 27, 1912

A regular meeting was held, Nov. 27, 1912, with the following program:

1. "Clinical Observations of Carbonic-Acid Baths on the Circulation." (By invitation.) John Henry Honan, Bad Nauheim, Germany.
2. "The Evolution of the Bacteriology of Urology," G. Frank Lydston.
3. "What Should be Done with Tuberculous Puerperae and Their Children?" Charles S. Bacon.

DISCUSSION ON THE PAPER OF DR. HONAN

Dr. Alfred C. Croftan: I have never been able to convince myself that the effect of carbonic acid-brine baths is greater or more certain in Nauheim than in the home bath-tub. For the effect after all is chiefly thermic and not due to any chemical properties inherent in the Nauheim mixture of salts. That sufferers from chronic disorders, especially individuals accustomed to lead the strenuous life, fare better in any watering place than at home is clear; but this is due largely to the psychic effect of undergoing a "Cure" in a resort famed for the treatment of such disorders; it is due, furthermore, to the complete respite from daily worries and tribulations and exertions at home; to the fact that the patients are making it a business to take care of themselves and that they have nothing else to do. The advantage, of course, of enjoying the professional services of physicians who are especially trained and experienced and who can give these people abundant attention, because they are being abundantly compensated, must not be underestimated.

When a trip to Nauheim cannot be undertaken an efficient home arrangement for taking Nauheim Baths can easily be installed. An half-inch lead pipe, bent to fit around the bottom of the bath-tub, perforated with pin-hole openings an inch apart, and attached to a compressed carbonic acid gas cylinder, procurable through any druggist furnishes the gas apparatus. A pound or two of rock-salt with an ounce or two of calcium chlorid to a bath-tub full of water of the proper

temperature furnishes the brine bath. An electric fan to blow away the carbonic acid gas rising to the surface of the water, an ice cap for the head and a bath thermometer complete the installation. If need be an "hourly" nurse, trained in giving the proper treatment during and after the bath can be secured, or a member of the family can easily be trained. This outfit can be procured by any family in even moderate circumstances, certainly in America where adequate bath facilities are a necessity, not a luxury, as abroad, and where the populace bathes as a matter of fact and not as a matter of conversation. The comic supplements, by the way, and the comedy stage to the contrary notwithstanding, the English gentlemen, in my experience, speaks as little of his "tub" as his American confrère of his bath.

The main advantage of employing hydriatric measures wherever possible in the place of drugs, lies in this, that drugs can be kept in reserve for emergencies; they will display greater potency when they operate in a virgin soil that is not impregnated with medicines. Much smaller doses at all events will generally be required to produce the desired result. I refer especially to heart tonics and vasodilators.

The chief effect of carbonic brine baths is upon the action of the heart and the blood-pressure. The thermic effect, reinforced and prolonged by the CO_2 and the salt, varies according to the temperature of the bath that is maintained, i. e. whether it is indifferent, i. e. equal to the body-temperature, sub-indifferent or super-indifferent. A fall in the blood-pressure can be brought about both by baths below and above the body-temperature. The warmer baths are preferable and safer in arterial disease. For the lowering of the blood-pressure by sub-indifferent baths is the result of a "tonic" dilatation of the peripheral vessels, whereas after warmer baths the dilatation is "atonic," relaxed. Immersion in a cool bath, even a few degrees below normal, produces at first a contraction, followed promptly by a dilatation of the peripheral vessels, called the reaction (later again contraction, because the tone is preserved), whereas warmer baths produce at once a cutaneous hyperemia without preceding blood-vessel contraction and, if continued, true relaxation of the muscular coats of the peripheral vessels with a corresponding fall of the blood-pressure; the effect of super-indifferent baths is also more prolonged. Moreover, heat, if applied for a sufficient length of time ultimately produces dilatation of the vessels of the deep circulation, whereas the dilatation of the superficial blood-vessels produced by sub-indifferent baths is accompanied by contraction, with high rather than low pressure of the central vessels, where low tension is most desired and high tension most dangerous.

In chronic nephritis with cardio-vascular changes, moreover, the vasomotor tone is, as a rule, reduced or perverted. This fact of vaso-motor instability in chronic renal disease is not sufficiently appreciated; hence any measure, like cool baths, that throws additional labor upon an already fatigued and incompetent vasomotor apparatus, is irrational and dangerous and very liable to fail of the effect it is intended to produce.

Even though the action of these baths is largely thermic, the addition of salt to the bath and the insufflation of gas through the water is valuable. A sense of warmth and a reddening of the skin are noted sooner. The salt, moreover, to some extent "soaks" into the skin and grants a prolonged effect even after the patient is out of the bath. The gas adheres to the skin in fine bubbles, so that in thousands of places areas covered with water are in close proximity to areas covered with gas; then the gas areas become covered with water as the bubble detaches itself. This implies a constant alternation of thermic influences over the whole surface of the body and no doubt creates a greater vasomotor effect. Some CO_2 is also absorbed and stimulates deeper respiration, as manifested by an increased exhalation of CO_2 without a corresponding consumption of O.

That strict individualization is necessary, careful regulation of the frequency, the duration, the temperature of the baths according to the effects and reactions produced is self-evident. Nowhere is routine more dangerous or more useless.

A great deal of harm can be done by these baths. If the physician has no time or inclination to study his patient's reaction at least a few times before, during and after the bath, he should omit this form of treatment altogether or delegate it to some one who knows what to look for and how to control the remedy. This applies particularly to patients with myocarditis, arteriosclerosis and chronic cardiorenal affections (Bright's). And here above all things one must be sure that it is desirable to reduce the blood-pressure. The patients often feel worse and are worse when the arterial tension falls or is reduced. The heart has accustomed itself to operate against a certain high pressure, the elevated tension is a process of conservation; when the pressure comes down the heart "races" just as the engines of a steamer gauged to turn a screw against a certain pressure of water, race, and rack the ship, when the screw comes out of the water.

Regular Meeting, Dec. 4, 1912

A regular meeting was held, Dec. 4, 1912, with the following program:

1. "Frequency and the Importance of Diagnosis of Cervical Rib." Joseph L. Miller.

2. "Intratracheal Insufflation Anesthesia. With Demonstration on Animals." (By invitation.) B. Merrill Ricketts, Cincinnati, Ohio.

CHICAGO MEDICAL SOCIETY, ENGLEWOOD BRANCH

Regular Meeting, Jan. 7, 1913

If a good beginning is an indication of success then the success of Englewood's meetings for 1913 are assured. The first meeting of the year was held on the evening of January 7, at the Englewood Hospital, the subject being a "Symposium on Diseases of the Gall Bladder and Bile Tracts." Over fifty (53) "live wires" turned out and some very brilliant "sparks" were in evidence. The papers were extremely fine, covering the subject thoroughly, very instructive and interesting, and brought out discussions of the highest order.

Dr. C. F. Weir, in a very entertaining and thorough manner, took up the subject of "Symptoms and Diagnosis of Diseases of the Bile Tracts," describing the various stages from the quiescent stage of early simple infections to the very active stages, marked by gall-stone attacks and inflammation of tracts and surrounding structures, taking up the sequelae and analyzing the different stages as to symptoms and diagnosis.

Dr. F. C. Eggert read a most excellent paper on the "Surgical Technique of the Bile Tract." He stated that in his opinion successful operation upon the bile tracts was, perhaps, the most difficult on account of the many complications. His paper was further enhanced by some beautiful drawings, which he used to explain points in the technic, and which were greatly appreciated by his hearers. He also presented a specimen of the liver, nicely dissected, showing the normal anatomy of the bile tracts.

Dr. Joseph L. Miller, who was to have opened the discussion, was unable to be present, much to our regret. The same being true as to Dr. W. S. Hector.

Dr. F. A. Weatherford opened the discussion, reporting a case of Rupture of the Gall-Bladder, upon which he had recently operated.

Dr. L. J. Osgood gave an interesting talk, stating that he suspected gall-bladder trouble in any case of "stomach trouble" coming on after the age of forty.

Dr. W. H. Buhlig, as usual, gave an interesting discussion reciting a case of gall-bladder disease in an alcoholic showing diabetic symptoms (sugar in urine), multiple neuritis, pancreatitis, etc.

Dr. Carl Langer gave a most interesting discussion with special reference to jaundice, a subject which Dr. Miller was to have discussed, but which was ably handled by Dr. Langer, who also brought out many other good points.

Dr. J. H. Hess spoke very entertainingly upon the non-operative cases and gave some valuable suggestions.

Others, too numerous to mention, entered upon the spirit and discussed, bringing out good points. Among them were Dr. H. Betz, president of the Stock Yards

Branch, Drs. V. D. Lespinasse, H. H. Mather, J. J. Moorhead, McClintock of the South Side Branch, S. T. Felmlee, R. M. Parker and others.

A meeting from nine until midnight and not a dry moment. What more can you ask? Come next time and see for yourself.

A. G. BOSLER, Secretary.

Twelfth Annual Banquet and Ladies' Night, Jan. 20, 1913

The twelfth annual banquet and ladies' night of the Englewood Branch which was held on the evening of Jan. 20, 1913, at the Stock Yards Inn, 42d and Halsted streets, fully sustained the prediction that it would prove to be the banner banquet. Englewood firmly believes in progression, and that each year may prove to be better than the previous is our ardent object. Hard work, backed by originality and double-backed by hearty and cheerful cooperation of our members, opens the gateway to success. It is, indeed, fitting that the twelfth annual banquet, presided over by Dr. C. Hubart Lovewell, who had previous to his election to the presidency, served, faithfully and ably, the society as their secretary for eleven long years, should be the banner banquet. That the banquet was a huge success was the unanimous opinion of each and every one of the one hundred and sixty-two present, and everybody well pleased. Success? Well, I guess.

To the banquet committee, of which Dr. J. W. McGuire is chairman, great credit is due, likewise to the program committee, of which Dr. J. H. Hess is chairman, and to them the satisfaction of having "put over" a brilliant success is ample reward for their ardent labor. To each and every one present we extend our sincere thanks for their hearty cooperation, realizing that without their help success would have been impossible.

Great credit is due Mr. Hill of the Stock Yards Inn for the able and efficient manner in which he handled the large crowd. The service was all that could be asked, the food the very best and served to the "Queen's taste" (and there were many Queens present) and praised by all.

The entertainment was in the form of a cabaret banquet, distinctly Englewood in style, in fact everything pertaining to the banquet was Englewood, even to the visitors from the Stock Yards and South Side Branches, for they are friends of Englewood.

Depew's famous orchestra and the celebrated Ingleside quartette—both Englewoods. If you doubt it ask Dr. McGuire. Why, Mr. Hill informs me that the steer from which that lucious beef was obtained was an Englewood steer, fed on the home grown corn raised on the farm of Dr. H. H. Mather, and located in the southern part of Englewood. Likewise that most delicious fish was caught by an Englewood man, in fact everything on the big bill was Englewood, home grown, except those fine blue points, and even they were shipped, choice-picked, for Englewood. The music furnished by the orchestra and the singing of the quartette was all that could be wished. Their efforts were enjoyed and appreciated.

Of special mention was the sweet harp playing by a young Englewood lady, Miss Helen Langer, who most beautifully executed a solo which was greatly appreciated. She is the daughter of an ex-president of Englewood, Dr. Carl Langer. Dr. J. A. Waska, esteemed member of Englewood, gave a most excellent exhibition of what the violin can do when in the hands of a master. Both Miss Langer and Dr. Waska are masters of their respective instruments and their playing came as a revelation, completely captivating the good crowd.

Ah! Some one asks, "How about that fine address of Dr. Woods Hutchinson, of New York City?" Answer, "Englewoods." If you never knew it before please stand informed that Dr. Woods Hutchinson is a member (Honorary) of the Englewood Branch. Dr. Hutchinson's address was pregnant with wit and humor, most instructive, interesting and entertaining, appreciated and applauded by all.

And—Well they danced and had a good time. Almost everybody was there. You didn't get there. Well, your loss. You missed it.

A. G. BOSLER Secretary.

CHICAGO OPHTHALMOLOGICAL SOCIETY

Regular Meeting, May 20, 1912

The President, Dr. Thomas Faith, presiding.

SYMPOSIUM ON CHRONIC GLAUCOMA

ETIOLOGY

Dr. Martin H. Fischer's (Cincinnati) address on the "Etiology of Chronic Glaucoma" was, in part, as follows: Glaucoma is an edema of the eyball and all the clinical signs of this pathologic entity are referable to this. The eye, like any other tissue in the body, holds normally a certain amount of water. The amount thus held is determined by the hydrophilic colloids of the eye (the proteins chiefly) and the state in which these exist (normal hydration of the tissue colloids). Edema is a condition in which the amount of water thus held is increased, in other words the hydration capacity of the colloids has been increased. In glaucoma the hydration capacity of the tissues of the eye (including the vitreous and aqueous humors) is increased. Various conditions are able to increase the hydration capacity of a protein colloid and so lead to an edema of the affected part. A most important factor in this regard, if not the most important, is an increase in the amount of acid present in the part. Any circumstance therefore which will lead to an abnormal production or accumulation of acid in the eye will lead to the signs and symptoms of glaucoma. What are ordinarily classed as causes of glaucoma (arteriosclerosis, circulatory disturbances, kidney disease, hard mental or muscular work, worry, high protein diet, diabetes with acidosis, local circulatory disturbances in the eye, intoxications of a general or local type which affect the eye, injuries and operations affecting the eye, cold, starvation, etc.) all have this in common, that they lead to an abnormal production or accumulation of acid in the eye. In consequence of this abnormal acid content the hydration capacity of the ocular colloids is raised and a glaucoma results, not because water is pushed into the ocular colloids, but because these suffer changes which make them suck in water from any available source (they swell). Obliteration of the filtration angle is not the cause of glaucoma, but a consequence resulting from the fact that in glaucoma the colloids behind the lens swell more than those in front, and so the lens and iris are crowded forward. As the swelling progresses the glaucomatous eye tends to make itself worse, for in swelling it compresses the blood-vessels within the eye (including those in the ciliary body) and so adds to its already precarious state the superimposed effect of a lack of oxygen due to defective blood-supply; and so by the resulting further abnormal acid production and accumulation a vicious circle is established. Eserin and other drugs which by contracting the iris open up the vessels in the ciliary body and so give a better blood-supply, may therefore at times be successful in removing a last straw which makes an eye just on the edge of a glaucomatous attack go over; on the other hand atropin, cocain and similarly acting drugs have a reverse effect favoring not only a compression of blood-vessels, but adding a direct toxic effect which in the end leads to an abnormal production and accumulation of acid.

In the treatment of glaucoma we must first get as clearly as possible before our minds all the conditions which in our patient are leading to an abnormal production or accumulation of acid in the eyeball. Rarely will only one etiologic factor be responsible, and rarely will we find these etiologic factors to be limited to the eye only. An abnormally high acid content may be induced in an eye quite as easily through an abnormal acid production which results from too hard muscular work, a leaking heart or a bad dietary regime as through an arteriosclerosis that manifests itself particularly markedly in the circulatory apparatus of the eye, an inflammation of the ciliary body or a cataract extraction.

When we have removed as many of these conditions as possible, we then meet the effects of those which we cannot remove. Our therapy comes down to this. We need to give alkali to neutralize the acids present in abnormal amounts; we need to increase the salt content in the tissues of the eye, for all salts, including

such natural salts as sodium chlorid, decrease the amount of water that can be held by any protein swelling in the presence of an acid; and, finally, we need to give water to wash out the acids (and other substances) which are capable of increasing the hydration capacity of the ocular colloids.

In actual practice this is accomplished as follows. As the patient is usually in the midst of a glaucomatous attack at the time that we see him, we describe the handling of this picture first.

1. It is our purpose to dehydrate the swollen eye as rapidly as possible. To accomplish this end we need to raise the concentration of alkali and salt in the affected eye, to do which we may use either local or systemic means or both. We are offered the choice here of either treating the eye directly or getting the whole patient under the influence of salt and alkali and incidentally his eye. To obtain a dehydration of the eye by systemic means we stop the intake of water by mouth and, observing the rules that have been frequently laid down before, we inject slowly into the rectum by the drip method and have the patient retain a liter, or, if necessary, two liters of the following alkaline, hypertonic sodium chlorid solution:

Monohydrated sodium carbonate	4.1 grams
Sodium chlorid	14.0 grams
Distilled water	1000. c.c.

When the injection is properly given the alkali and salt content of all the tissues of the patient's body is increased by this means, and the swollen eyeball shrinks. In from one to three hours the glaucomatous eye will then have returned to its normal tension. During the past year he had found a proper utilization of this scheme of treatment so effective that he had relied upon it entirely and so has largely given up the use of subconjunctival injections of sodium citrate.

Once the tension in a glaucomatous eye has been brought down the patient must be kept from getting renewed attacks by keeping his metabolism constantly well toward the alkaline side. This means that the patient must be taught how to inhibit his acid producing factors while at the same time he is put under the influence of a sustained administration of alkali, salts and water. Only in this way can an eye on the verge of a glaucomatous attack from such a condition as an arteriosclerosis of the blood-vessels supplying the eye be kept from going over into a frank attack as the acid content in the eye is pushed beyond these tolerable limits by hard work, mental worry, dietary indiscretions, etc.

2. Local treatment in glaucoma resolves itself into an administration subconjunctivally of harmless salts which are particularly powerful in reducing the hydration capacity of swollen colloids. A freshly prepared sterile sodium citrate solution (5.41 per cent. solution of the ordinary chemically pure $Na_3C_6H_5O_7+11\ H_2O$) is used. Enough must be injected to gently distend the subconjunctival tissue (10 to 15 drops). The short lived pain following such an injection may be relieved by alternate hot and cold compresses. Failure to get a prompt reduction of tension by such means indicates that the solution was of wrong composition, or that enough was not injected, or that the systemic acid content is so high that use of the salt subconjunctivally does not even temporarily prove effective.

What is known as glaucoma in the eye is identical with the series of changes which in the kidney we call nephritis, and the principles of treatment governing both conditions are the same.

MEDICAL TREATMENT

Dr. H. B. Young (Burlington, Iowa), in his presentation of the "Medical Treatment of Chronic Glaucoma," expressed regret that there obtained in the literature an absence of unanimity of a definite nosology for this affection. He referred to a paper presented by himself in 1907 at the Louisville meeting of the Academy, in which he had made a plea for the adoption of Schweigger's classification, viz., that a sluggish, more or less dilated pupil and a shallow anterior chamber, no matter how quiet the eye had otherwise been, always spelled inflammatory glaucoma. In this paper he also attempted to show that the use of the term "chronic" was

misleading, because an inflammatory glaucoma which showed distinct periods of remission might be termed chronic or sub-acute as against the acute or fulminating; and in the non-inflammatory, as distinguished by changes in the posterior segment of the globe only, unnecessary, because this process is but seldom rapidly progressive. The consideration of the purely medical therapy side of chronic glaucoma Dr. Young thought might be briefly disposed of were it not for the fact that many "side issues" of such treatment suggested themselves to him as worthy of extended consideration. In this connection, he cited the complete and permanent relief with miotics of the glaucoma, immediately following cataract extraction and, in the same category, those sudden outbreaks peculiar to men of strenuous habits in middle life. He admitted that these are isolated instances and suggested, as a working hypothesis, that in those isolated instances the miotics *tided over* a condition which he had designated, for want of a better name, a "threatened reversal of ocular metabolism."

In assigning this hypothesis through analogy he had found much similarity in studying the experience of the investigators who were laboring to solve the problem of sympathetic ophthalmia. In the latter affection, he had noted that every avenue of communication had been diligently searched to find the route of infection and with no invariable result; that this line of investigation had also failed to account for the fact that a large number, possibly a majority, of those having typically dangerous wounds remained indefinitely immune. It was not until Elschnig, impressed by the association of auto-intoxication with similar ocular conditions, conceived the idea that sympathetic ophthalmia (analogy again) had an extra-ocular origin and reported his observations, that we obtained a logical or comprehensive view of the sympathetic process.

In the consideration of the possibility of the extra-ocular origin of glaucoma the essayist called attention to the fact that auto-intoxication had apparently been responsible for sudden failure of vision, without observable tissue change in some cases of the non-inflammatory variety. At the Denver meeting of the A. M. A. (1898) in a symposium on amblyopia, he had reported a series of cases, attributable to auto-intoxication. This report, he believed, was one of the earliest contributions to the subject in this country. The product of this intoxication in such cases, he held, was a nerve explosion, which writers refer to as profound emotion. On this basis, he explained the glaucoma after cataract extraction and in the man of strenuous life, the victims of exhaustion. In the latter, if we relieve him of his business cares and clear out his alimentary canal, we get results with miotics. In a similar way, he believed, the successes reported by the older writers, from the use of calomel and opium and the salines, may be explained.

From these suggestions about the origin of glaucoma, it naturally follows that its medical treatment is practicable only in the presence of the disturbed nerve function and before a reversal of metabolism is established. In his opinion the medical treatment of chronic glaucoma has not been without merit and that there is to be a more comprehensive practice of it in the light of new findings hardly is to be doubted.

SURGICAL TREATMENT

Dr. Charles H. Beard, in presenting the "Surgical Treatment of Chronic Glaucoma," laid emphasis on the point that surgical measures, in the treatment of chronic glaucoma, should be resorted to only when less radical measures are clearly contra-indicated, or have failed to accomplish the desired result. The surgical measures available he divided into two great classes, viz., the *Intra-ocular* and the *Extra-ocular*. Some of these measures have merely the relief of pain as their object, but the majority of them contemplate the reduction of intra-ocular tension; which is the predominant symptom of the disease and the source of most of the morbid manifestations.

The *Intra-ocular operations* comprise four methods: 1. Operations on the iris, designed to free the iris angle from adhesions between iris and cornea and re-establishing the natural communication between anterior chamber and Schlemm's canal. 2. The various forms of anterior sclerotomy and sclerectomy, which aim

to create channels of drainage between anterior chamber and the subconjunctival tissue. 3. Establishing a passage for the interchange of fluid between anterior chamber and peri-chorioidal spaces. 4. Promote anastomosis between the deep blood-vessels of the peri-corneal region and those of the conjunctiva and subconjunctival tissues. The primary object of these various procedures, accomplished either by incision, excision or tearing away, is the restoration of normal filtration or the substitution of artificial or vicarious filtration.

In discussing iridectomy, as a measure for the restoration of normal filtration, Dr. Beard called attention to the prevailing opinion of ophthalmologists that this procedure can not be depended upon to afford relief in cases of chronic glaucoma but that it acts most favorably in the comparatively early stages of simple glaucoma, in those cases where excavation of papilla is not well established; in those characterized by considerable hypertonicity of globe or marked fluctuations in the tension, with accesses of pain, rainbow vision, by inroads upon the visual field and varying sectors of suppression of the peripheral light sense. He enumerated as positive contra-indications to iridectomy cases in which the glaucomatous process has been insidiously progressive with a marked contracted field, the patient being unable to read fine print connectedly and the nerve head changes well advanced. As a single measure he considered iridectomy contra-indicated when the fellow eye had been iridectomized unsuccessfully.

He emphasized the importance of frequent and close observations of the visual field and regarded any form of surgical intervention dangerous when the retraction nears the center at some point. In the consideration of *anterior sclerotomies and sclerectomies*, the essayist reviewed the origin of these procedures beginning with Von Graefe, who, having observed how frequently antiglaucomatous iridectomy was followed by a cystoid cicatrix, at first conceived the idea that this spongy tissue, by permitting the aqueous to filter slowly through, might exert a favorable influence upon intra-ocular tension. Von Graefe later, however, came to the conclusion that such cases gave no better results than those in which healing had been prompt and uncomplicated. De Wecker's and Stellwag's theories, in this connection, were also dwelt upon at length by the speaker. Dr. Beard recognized the fact that a cystoid scar, with or without participation of the iris, will often serve to regulate the tension; but pointed out that when the iris is incorporated the cicatrix may be a source of irritation—lead to loss of eye, the development of a sympathetic inflammation and is exceedingly vulnerable to infections from the conjunctiva or lacrymal canal. Such hazards, he pointed out, were the chief objections to all procedures designed to intentionally incorporate the iris in the cicatrix. The great desideratum he conceived to be the creation of a more or less permeable cicatrix that shall be safe and lasting.

Of the various procedures suggested, the least complicated and least harmful of all, in his judgment, is simple anterior sclerotomy. He reviewed in detail the technic of simple anterior sclerotomy according to the method of Stellwag and De Wecker. He called attention to the almost unanimous opinion of ophthalmic surgeons that it is unwise to make large incisions or openings, whatever their nature, about the base of the cornea, in chronic glaucoma. The large openings are not more efficacious than smaller ones and with the larger, complications are more frequent; the iris likely to fall into the wound, vitreous to escape, and high astigmatism develop.

In discussing the combined anterior sclerotomy, Dr. Beard referred to the advantages of conservation of the sphincter of the iris in performing the iridectomy. He considered it highly desirable to have the innermost zones of the iris intact; the pupil in such instances responding better to miotics. Of the various procedures of anterior sclerotomy the essayist dwelt in detail upon two, the method of Herbert of Nottingham and that of Bjerrum of Copenhagen.

Discussing perforating sclerectomy, he reviewed the operations of Lagrange and Holth. In considering the methods of trephining the sclera, the speaker described in detail the Elliott procedure. In this method, the spot selected for trephining should be as close to the limbus as possible; if this cardinal rule is disobeyed two dangers confront the operator; 1. He is much more likely to have

an escape of vitreous than if he obeyed the rule; and 2, he will probably fail to enter the chamber with his trephine and will have to burrow his way into it by the aid of a curette or other instrument; in so doing, he will probably, if not certainly, injure the ciliary body. As complication, when working with a small trephine, the speaker mentioned that occasionally the excised disc dropped into the anterior chamber. Young had suggested passing a loop of fine thread, by means of a tiny curved needle, through center of part to be excised and passing ends through hollow handle of trephine. The speaker presented a drawing of a tpehine, original with him, which provided for a central member either with barbed spear or a screw end, for fixing the instrument, steadying the trephine and preventing the excised disc from dropping into the anterior chamber.

Of the operations to establish communication between the anterior chamber and the peri-chorioidal spaces, the speaker referred to the cyclo-dialysis procedure of Heine. Clinical data, the speaker stated, show that favorable results of cyclo-dialysis have been obtained in relatively few cases, that they are seldom lasting and that complications are, perhaps, more frequent after this than after most of the antiglaucomatous operations.

Discussing non-perforating sclerectomy, the essayist described the theory and method of its chief exponent, Bettremieux, of Roubaix, France. As to posterior sclerotomy, the speaker considered it only applicable to blind eyes with enormous tension, effacement of the anterior chamber and atrophy of the iris, with maximum pupil.

In reviewing the extra-ocular operations, the speaker referred to Jonesco's extirpation of the superior cervical ganglion, Bardal's elongation or plucking out of the external branch of the nasal nerve, Roemer's extirpation of the ciliary ganglion and optico-ciliary neurotomy.

DISCUSSION

Dr. H. W. Woodruff, in opening the discussion on Dr. Fischer's paper, said: The experiments which Dr. Fischer has performed are certainly very interesting and very valuable to physicians in general and especially to oculists. Any of us, though we are not physiologic chemists, can readily appreciate that the variable affinity of colloids for water must have something to do with the pathogenesis of glaucoma. It will be of great assistance to us as clinicians, however, to constantly remember that there is no such thing as a single cause for any disease. Glaucoma is no exception to this rule. Since he was not enough of a chemist or physiologist to discuss this subject to any profit from Dr. Fischer's standpoint alone, yet without being able to prove his contention, he felt certain that while there may be cases of glaucoma due to a development of certain acids and a consequent absorption of water as has been shown, there are other theories or there is at least one other which is worthy of notice. If every case was due to the absorption of water then any case should be relieved by sub-conjunctival injections of solutions of sodium citrate. He had been using this solution since Dr. Fischer's first publication with marked results in some cases and no results in others. He thinks others must have had the same experience. It seemed to him that, without detracting from Dr. Fischer's theory, our attention could profitably be directed to Henderson's theory. Briefly he accounts for hypertension in an eye ball by two causes; first, a sclerosis of the pectinate ligament or, as he calls it, the cribriform ligament, which lessens the ability of the aqueous to escape to the canal of Schlemm; and second, an increased blood-pressure within the eye. With only one of these conditions present there will be no glaucoma but with both present hypertension is the inevitable result. Henderson explains his point by a working model. (Dr. Woodruff exhibited a chart, explanatory of Henderson's theory.) The Henderson conclusion is, therefore, that there is a predisposing factor, which is the sclerosis of the cribriform ligament and an exciting and variable factor, which is the circulatory pressure. Is it not possible that whereas Fischer's theory will explain the most acute attacks of glaucoma, Henderson's theory will better explain the more chronic and less inflammatory forms?

Dr. J. E. Colburn, in opening the discussion on Dr. Young's paper, said: The treatment of glaucoma should begin before the glaucoma occurs. There are certain eyes and certain conditions of the circulation that tend to produce glaucoma. When these conditions are known to be present or any other condition is known to exist that might favor the development of glaucoma we should direct our treatment toward them, so that the patient's general health may be put on the proper plane. Even before any sign of arteriosclerosis is noted we must bear in mind that these patients are liable to glaucoma. Glasses should be ordered or a change of glasses made and a proper position as to light, etc., maintained. These patients should avoid the excitation of profound and grave emotions. They should lead temperate and regular lives. They often come for advice, but they prefer to go on as they have and follow their own inclinations, hoping that they may not suffer from the results of their indiscretions. Therefore, it is difficult to manage these patients.

Arteriosclerosis is one of the greatest factors in the production of glaucoma. He had seen a number of cases in recent years in which glaucoma symptoms would appear under the treatment with myotics, and with proper care of the intestinal canal and general hygiene they would disappear. Dionin has been of some value in these cases. Eserin is useful in the later period of the disease. The continued use of salicylates, as suggested by Gifford, a grain per pound of body weight, and of bicarbonate of soda with an occasional dose of citrate of potassium, has given good results in the preventive treatment of this disease. However, sometimes our efforts are absolutely futile, even our best endeavors fail, and he has always hoped that perhaps the acidosis theory might help us out. Just now he was watching with interest a case in which for four years there have been occasional increases of tension, with all the symptoms of a chronic glaucoma. Under the wise management of a general practitioner, who fully understands the conditions, they subside. He saw the patient occasionally and supervised the treatment. Sometimes there was a general ocular edema, but it disappeared under appropriate treatment and the vision improved and the corneal sensitiveness returned. During the last three months he has had only three spells of increased tension. The real underlying condition in the case is a chronic albuminuria, and back of that a sclerosis.

He would like to know more about the acidosis theory. It is exceedingly interesting and he hoped it would lead to better results. He was in accord with Dr. Young regarding the preliminary treatment, believing that treatment prior to the attack was of the greatest value.

Dr. George F. Fiske, in opening the discussion on Dr. Beard's paper, said: The thing that had impressed him most was the fact that there had been so many operations for glaucoma and yet we saw so few people who have been cured. There was a time when there was a man who was very successful in his operations for glaucoma, because in most of the cases where he did an iridectomy there was no glaucoma. He stated that he knew a patient who had been operated on by Graefe five times on both eyes in 1882 and 1883, and now had very nearly perfect sight. His vision is between 20/30 and 20/40.

He remembered a paper read by Dr. Bull before the American Ophthalmological Society, in which he reported eighty or ninety cases operated on, with practically no success. He was very pessimistic. Dr. Fiske believed in the operation but thought it must be done early. The living of the patient and attention to all those things that help so much in the treatment of any case, such as hygiene, proper food, etc., should be an important part of the treatment and should be carried out systematically and faithfully. He did not believe in waiting but thought one should operate right away.

Dr. George F. Suker was particularly interested in Dr. Fischer's theory of glaucoma. This in combination with Dr. Henderson's theory will, he thought, come as near explaining the production of glaucoma as any theory we have. As far as the treatment is concerned, one treatment is about as good as another. The results, as a whole, are about the same. It resolves itself into a question of etiology. Up to the present time he did not know of any solution of the question

more appropriate than that given by Dr. Fischer and the one by Henderson. The theory of acidosis appealed to him as the best. Colloids will swell in water. We could not produce an alkalinity, but we could produce a more or less acid condition. That was always brought about when there was occlusion, lack of filtration or absorption; and, as soon as there is a blockage or closure of the filtration angle, which the Henderson theory consists of, it gives rise to an acid condition because of the blockage. There is lack of absorption of water and increased tension.

The arteriosclerotic condition is perhaps the most common basic cause of glaucoma. There is frequently an arteriosclerosis in the peripheral arteries, and naturally the arteries of the eye would be similarly involved, just like the arteries in the kidney, which causes a swelling of the kidney. In the eye the pectinate ligament swells, crowding forward the lens, and obliterating the angle, so that one is bound to have stasis, exudation and transudation, and then acidosis, at least locally. The tension of the globe cannot be higher than the arterial pressure, as has been demonstrated by Henderson. He had seen these eyes that Dr. Fischer operated on and all his experiments have resulted the same. Experimentally, it is true, but practically, it is a different question, because we have to deal with several conditions. The circulation of the eye is somewhat different than can be represented in a test tube. Then there is a psychologic aspect—the psychologic trauma, which must be considered. The sequence is increased heart beat, increased blood-pressure, blockage of the pectinate angle, exudation, lack of absorption and acidosis.

As far as primary and secondary glaucoma are concerned, the underlying pathology is the same. The chronic condition is simply a slow process and the eye gradually accommodates itself to the increased pressure, the same as the brain to a slow growing tumor. As far as treatment is concerned, experience has shown that it is still in a very unsatisfactory state.

Dr. H. S. Gradle thought Dr. Fischer was on the right track. He had a little experience with glaucoma cases recently, which he had treated according to Dr. Fischer's theory, with almost perfect results. He would like to ask Dr. Fischer how he can explain the fact that we get a glaucoma practically only in hyperopic eyes, rarely in myopic eyes. He had not been able to answer that question with satisfaction to himself.

Dr. Thomas Faith said he would like to ask Dr. Fischer whether he believed that the increase in growth of the lens in a comparatively small eye or fibrosis of the pectinate or cribriform ligament were predisposing causes for glaucoma? He had had two experiences with the use of sodium citrate in glaucoma. One was a case of acute exacerbation in a chronic glaucoma, an inflammatory exacerbation. He did an iridectomy, but got no relief. At the end of two days the tension was higher than before the operation. On the third day the wound was closed, although the line of incision seemed to be prominent. The tension was distinctly plus 2. On the fourth day he began to inject 5 per cent. citrate of soda solution. There was no reaction for two hours, and the intern said that after five or six hours the tension was distinctly reduced. The following day the tension was still above normal. On the third day he gave another injection, but noticed no effect. The intern was positive that in the afternoon the tension was reduced and the following morning it was reduced. Two days later he gave another injection, and the tension fell to normal and remained at normal ever since. His conception of Dr. Fischer's theory is that the citrate of soda injection may be the means of temporarily reducing the tension; then if we look after the general conditions which predispose to this acidosis, we will probably succeed in effecting a cure. He had had a case of chronic non-inflammatory glaucoma which he has watched for a long time. This patient had an acute exacerbation after an attempt to take the tension of the eye with a tonometer. The conjunctiva was so chemotic that it seemed as though the patient had an acute attack. He succeeded in reducing the tension by hot applications and strong eserin solutions, two or three grains to the ounce, but later it went up again. This patient had a high urinary acidity, so he gave her large doses of bicarbonate of soda and ordered her to drink much water. The diet was modified and the tension fell to normal and has remained there

although he is still using the eserin. In 1905, a man, 61 years old, consulted Dr. Faith regarding a typical chronic glaucoma in one eye. Vision was reduced to perception of light in the temporal field. The lens was clear and the pupil fairly well dilated and immobile. He ordered eserin and watched him until May, 1907. The tension never was reduced to normal, but the eye was not painful. Then he went abroad; was gone six months, and when he returned the lens was completely opaque and tension was normal and has remained so. The eye is absolutely blind and the iris reacts only indirectly. There is not even light perception in that eye. He wondered if a swelling of the lens could account for the condition and if a lens could swell to the extent of producing such tension and yet remain clear. It was clear, so far as he could see, though he had not dilated the pupil to examine its periphery. Later the lens became completely opaque, and the high tension disappeared. The fellow eye remains normal as to tension, vision and fundus.

Dr. Richard J. Tivnen thought Dr. Fischer had done an immense amount of original work and he was glad to have heard his instructive paper. While his theory might not be the correct one, yet his work could not fail to be of value. He had used the sodium citrate therapy, which Dr. Fischer advocated, with varying results. Some patients reacted pretty well; others did not. All told, the treatment did not seem to fill the gap that he had hoped it would.

Dr. Fischer's theory is that glaucoma is produced by an edema, which is increased by acid conditions and lessened by an alkaline condition. His explanation and his demonstrations seem convincing but the clinical data, supplied by numerous observers, covering a wide variety of glaucomatous manifestations is still wanting. This clinical data, after all, is the final test.

The Henderson theory, in conjunction with Dr. Fischer's, seemed to him to be a more rational explanation of the etiology of glaucoma than any hitherto advanced.

Dr. Martin H. Fischer (closing): Henderson's theory of glaucoma is essentially a blood-pressure theory and is therefore open to all the objections that may be raised to such. Henderson's model is very pretty but he has not shown that it is identical with what we have in the body. No one has ever proved that an increased blood-pressure, provided it is not accompanied by defective oxygenation of the blood, leads to edema, or that obstruction in the lymph channels, or a number of lymph channels, or the thoracic duct, gives rise to edema. Pure blood-pressure increase never leads to edema provided it is produced with arterial blood. High blood-pressure prevents edema. It makes life possible in organs affected with arteriosclerosis, and when it falls, in the eye for example, it is a sure way of precipitating an attack of glaucoma or of producing an exacerbation in cases of kidney disease. Decrease of blood-pressure (except so far as hemorrhage is concerned) is more dangerous than an increase.

As to why we have glaucoma in hyperopic eyes, more than in others, he did not know but ventured the opinion that the associated eye-strain is a factor. Schlerosis of the cribriform plate, is, as he had said, a result—not the cause—of glaucoma. Iritis and subsequent scarring lead to a defective circulation in the eye, and thus tend to favor the maintenance of glaucoma. Priestley's theory that an increase in the size of the lens is responsible for a glaucoma, is, he thought, a case of looking on the effect for the cause. The increase in the size of the lens is an evidence of the swelling of the lens, as can be seen in any experiment on the eye. The acid accumulation in the eye, which makes the whole eye swell, also makes the lens increase in size.

The filtration hypothesis has been discussed in conjunction with edema anywhere in the body. In the eye, in glaucoma, it is simply a local problem. The question of filtration is a question in physical chemistry. We can not even filter water, let alone any colloid substance, through such colloidal membranes as we find in the body with anything like the pressures available here. The maximal values available in the body are 200 or, in extreme cases, less than 300 millimeters of mercury. But to accomplish filtration we need several atmospheres, in other words several times 560 millimeters. Where does the increased amount of albumin in the eye in glaucoma come from? It is analogous to the albuminuria of acute nephritis. We call it albuminuria when it comes from the kidney, and an increased

content of protein in the fluids of the eye in glaucoma. In both cases the proteins of the involved tissues go into solution in consequence of the increased acid content in the tissues. As to treatment, we agree in fundamentals. What is best done in a given case depends upon what we believe to be the underlying etiologic factors in the production of the acid accumulation and any remedy is good or bad as it helps or fails to remove these underlying etiologic factors. De Wecker and Stellwag said that the more acute the attack of glaucoma, the better the prognosis. Dr. Fischer had made exactly the same statement regarding nephritis and for the treatment of the nephritis had suggested the same thing as for the treatment of the glaucoma. Give alkalies, give salts; give water. The reasons are obvious. It is the same story as in glaucoma. Surgeons have decapsulated the kidneys to relieve a nephritis. That helps in many cases. On the other hand, we can help our nephritics quite as well by using alkali and salt. The old doctors gave salt by mouth and by the bowel, and in large doses. We give alkali in addition. Whether we relieve a case of glaucoma permanently or not depends on the underlying etiologic factors. If we have a syphilitic iritis with a secondary glaucoma, or an injury to the eye, the thing is to tide the man over the glaucomatous attack, and it makes no difference whether we stick a hole in the eye and reduce the tension, or give sodium citrate sub-conjunctivally or neutralize our acid effect in some other way. If we hold the tension down for two or three days, the etiologic factors responsible for the acid accumulation depart and that in an acute case, no matter whether it was iridectomized, or sclerotomized, or treated with sodium citrate, is synonymous with permanent relief of the glaucoma. On the other hand, if arteriosclerosis is the causal condition, we have a chronic case, and nothing in the way of treatment locally can as permanently relieve the condition. We must institute general treatment.

The prognosis is the same as in kidney lesions. An eclamptic woman who bears her child and whom we tide over the puerperium is a saved woman. The woman with a chronic interstitial nephritis secondary to arteriosclerosis and with a failing heart will produce enormous quantities of acid and we have to stay by her bedside all day to keep her sufficiently alkalinized and then we can only expect the most temporary relief, for a dying heart is not restored with alkalies and salts.

The use of sodium citrates in sub-conjunctival injections is not a cure for glaucoma. It never can be. If the tension can be kept down, so that we can save the eye temporarily and prevent another attack, the treatment has served its purpose. Sodium citrate simply reduces the tension. He had been interested to hear the reports of its use by others. He had not seen a single case where the tension did not come down. Sometimes druggists make a mistake in putting it up. They think the doctor has made a mistake in ordering so strong a solution. If sodium citrate solution is given, enough must be used. Gently distend the sub-conjunctival tissues. If the sodium citrate gets into the eye the tension has to come down. The only condition Dr. Fischer could conceive of where it will not come down is where there is an obstruction in the circulation of the eye of the gravest character or where the acid content is so high that the water gets into the eye out of the citrate solution before the salt itself. Another condition would be a systemic cause for the glaucoma, such as a heart or blood-vessel lesion of such a character that the generalized acidosis is so tremendous that local treatment is not enough. Then the case must be treated systemically, just as we would a case of acute nephritis. In fact the experience of the last few months had convinced him that it is as well, if not better, to treat all glaucomas systemically by using alkaline hypertonic salt solutions by rectum. In this way we raise the alkali-salt content of all the tissues of the body, including those of the eye, and so they all shrink and our glaucoma disappears even without the use of any local measures.

Dr. H. B. Young (closing): We are not so far apart after all. His own theory was a little fine spun, perhaps. The point he wished to make was that originally there must have been some nervous disturbance, such as we see with auto-intoxication amblyopias which affect primarily the circulation of the uvea. He had not enough opportunity to observe glaucoma and get extensive data. He

argued by analogy and the cases he had seen were relieved permanently. The only difficulty to his mind in the acceptance of the acidosis theory is the appearance of monocular glaucoma. He had also seen one case of glaucoma in a myopic eye, a man eighty years of age. He was going to put him on the alkaline treatment. He had very little pain or disturbance. The use of eserin or any myotic has been followed by an exacerbation of the condition.

Dr. Charles H. Beard (closing): All these measures have been attended by satisfactory results, but he was a great believer in simpler measures, simple incision into the anterior chamber for example, but always followed by pression massage. He believed that this is a great factor in the treatment of chronic glaucoma. The operation starts the curative process, and gets the eye in a condition so that myotics and massage may be effective. He had had a case of juvenile glaucoma under observation for many years, in which he made several incisions at the base of the cornea through the same spot, and succeeded in reducing the tension, but it did not remain down. Lately the patient has been taught how to make the pression massage, and she knows when she has reduced the tension. She also knows by the symptoms when to resort to the massage and can thus maintain a safe intra-ocular tension. Sclerotomy is a formidable operation, and there are apt to be iris complications, loss of vitreous and such things. That is why he prefers simple punctures of the anterior chamber, by long slanting incisions through the sclera into the iritic angle, followed by pressure massage. He considers that the best surgical treatment for chronic glaucoma.

RICHARD J. TIVNEN, Secretary.

Regular Meeting, Oct. 21, 1912

The President, Dr. Thomas Faith, presiding.

A CASE THAT HAD RECOVERED FROM SYMPATHETIC INFLAMMATION WITH NORMAL VISION

Dr. W. A. Fisher stated that the case was presented to the society three years ago at a symposium on sympathetic inflammation with a vision at that time of 3/200.

The history of the case is as follows: Elmer B., aged 11 years, was struck in the right eye May 17, 1907, with a piece of copper. Dr. Fisher saw him July 17, 1907, two months after the accident. The right eye was hopelessly blind and there was a well marked sympathetic inflammation in the left eye. The right eye was removed within an hour from the first visit, patient was put in bed, given eliminatives and as his weight was about 70 pounds he was given 70 grains of salicylate of soda every 24 hours which gave him no annoyance. Two drops of 2 per cent. atropin was instilled into the left eye every 4 hours and hot applications applied.

The left eye was much better the next day after the removal of the right eye but there was no vision on account of the dense exudate in the pupil. The pupil would not dilate and an iridectomy was performed July 30, 1907, to reduce the tension. The tension was reduced by the iridectomy but did not entirely disappear. Aug. 30, 1907, one month after the iridectomy and two months after the removal of the right eye, the left lens was removed on account of the tension. Sept. 30, 1907, one month after the removal of the lens the eye was practically quiet and remained in a semi-quiet condition for several months. From May, 1908, until May, 1910, the eye remained quiet except the tension which was about minus one. His vision during this time was about 3/200. The pupil was drawn up and practically closed.

May 20, 1910, two years after the inflammatory symptoms had disappeared an iridotomy was performed by the Ziegler method with a very sharp Ziegler knife. A large pupil was made and has remained open as you see it to-night. He was kept in bed after the operation, eliminatives and large doses of salicylate of soda given, atropin 1 per cent. and dionin 10 per cent. instilled in the eye four times a day. His vision soon began to improve and as the vitreous began to clear up his improvement was rapid.

Aug. 20, 1910, three months after the iridotomy his vision had increased to 20/65 with correction. From this time on the improvement was slow but sure. Nov. 30, 1912, his vision was 20/40. To-night the eye is perfectly quiet, has not given him any trouble for more than a year. His vision is 20/20 and he can read Jaeger No. 1.

The excellent result obtained may be attributed at least in part to the iridotomy being performed two years after the inflammation had subsided.

DISCUSSION

Dr. W. F. Coleman had seen many disastrous results in the loss of the sympathizing eye. In 1887 he reported 28 cases of sympathetic ophthalmia. He had removed sixteen. In twelve cases he advised removal but it was refused. He took personally a very strong ground on this subject because in earlier experiences blindness resulted in the other eye in at least six cases because his advice to enucleate had not been taken.

The late Dr. Noyes hesitated to remove an eye lost from a perforating wound of the corneo-scleral region because in the laboring class it is a serious matter to renew an artificial eye frequently. Dr. Coleman advises removal of all eyes where the wound is so serious as to cause prospective loss of vision to the patient not only because of danger to the fellow eye but for cosmetic and economic reasons. The eye is so deformed that the employer will notice it as a blind eye. An artificial eye obviates this and for all unskilled labor the patient is capable.

If the fellow eye is inflamed, would you remove the injured eye? In three cases among his 28, in which he had removed the injured eye with the presence of sympathetic inflammation and serious visual loss in the other eye, the vision in the sympathizing eye has those three cases quadrupled. So that it was his experience that the removal of the injured eye is of decided advantage.

As to the etiology of sympathetic inflammation, it would be presumptuous to question the dictum of the bacteriologist. Adami and others maintain that inflammation may occur without infection, so that Dr. Coleman thought sympathetic inflammation might occur without infection. In the last ten years he had not seen two cases of sympathetic ophthalmia, probably because of the antiseptic treatment of the injured eye, but he thought it possible for the eye to sympathize without infection. A patient of his had an injury of his right eye forty years previously. He had 20/200 vision in the fellow eye, an optic neuritis was present and he concluded it was sympathetic. Dr. Coleman advised removal of the injured eye. Within a week the fellow eye had 20/20 vision. Is it probable that auto-infection occurred after forty years, and the occasion for infection had never occurred before? Is it possible that that was an infectious process, a migratory process?

So far as he knew the actual bacteria of sympathetic ophthalmia have not yet been discovered. Brown Pusey, E. V. L. Brown and others maintain that it is infectious. Others maintain that it may be due to reflex irritation. Years ago Hughlings-Jackson held that a nervous irritation maintained long enough produces a reflex inflammation. Dr. Coleman thought we go a little to extremes in the laboratory idea; that we are forgetting clinical experience.

Dr. O. Tydings had no idea until to-night of the result of the treatment in Dr. Fisher's case. The last time he saw the patient was after an iridotomy had been done and the eye was still red. He saw it quite frequently from the beginning of this trouble until within the last year, and if ever he looked at what seemed to be a hopeless case of sympathetic ophthalmia it was in this case.

This result should be an encouragement to all of us and Dr. Fisher is to be congratulated for obtaining such a result. It shows what skillful and careful work can do for an eye. It is a beautiful result because 20/20 vision is as much as any of us have.

Dr. Wm. H. Wilder: In connection with his case of sympathetic ophthalmia, Dr. Fisher spoke of the importance of withholding operation in such cases until the eye has remained quiet for a considerable length of time. This point, Dr. Wilder thought, should be positively emphasized.

The temptation is to attempt an iridectomy too soon after the subsidence of the inflammation, and when it is done, however neatly, we are surprised to find that the coloboma quickly fills up with exudate, and possibly the inflammatory process is again aroused in the deeper structures. He makes it a cardinal rule in such cases to wait two years, at least, after all signs of active inflammation have disappeared before attempting iridectomy or removal of the lens.

If the lens has remained clear, an iridectomy may suffice, but usually it is found necessary to remove the lens, and if so, he prefers to do the iridectomy and the extraction at the same time, so as not to subject the eye to the irritation of two separate operations.

Dr. Fisher is to be congratulated on the excellent result obtained in his case, which goes to show that the inflammatory process has expended itself on the anterior portion of the uveal tract, and that the vitreous chamber had remained comparatively free.

Dr. Oscar Dodd: When Dr. Fisher presented this case before the Society the first time, Dr. Dodd had also presented a case of sympathetic ophthalmia in which the outcome was not so successful. The failure in Dr. Dodd's case was due to the fact that each time he had the child under treatment the parents would take her home as soon as the inflammation had subsided, and each time she returned with the eyes in a much worse condition.

Early operation is certainly contraindicated. He remembered one case years ago in which Dr. Fisher advised him to operate. A boy, 10 years old, had the most severe case of sympathetic ophthalmia that he ever saw. There was a large exudate behind the iris which looked like an iris bombé. Dr. Fisher thought it advisable to remove a piece of iris, which he attempted to do, but found it so thoroughly bound down that it was impossible to cut out even a small piece without removing the lens and entire exudate.

It is always a question what to do in these cases because of the tension; in some, it is impossible to restore sight because of the disastrous results from secondary glaucoma. The case he mentioned terminated in this way so there was not even light perception after a time.

Dr. Sidney Stephenson reported several cases in which he had good results by doing a small needling which did not disturb the iris; simply stirring up a layer of the lens and irrigating the anterior chamber thoroughly. In that way he prevented reaction and had satisfactory results when it would have been impossible to remove the piece of iris without producing a severe reaction.

Dr. Fisher is certainly to be congratulated on his good result.

A CASE OF MONOCULAR OPTIC ATROPHY FOLLOWING AN INJECTION OF OLIVE OIL AND LANOLIN

Dr. W. A. Fisher stated that the case presented itself to the clinic at the Chicago Eye, Ear, Nose and Throat College with a well marked atrophy of the optic nerve of one eye with the following history: About ten weeks ago a doctor injected olive oil and lanolin under the skin of the forehead for the removal of a wrinkle or frown.

The injection was made at 10 a. m. and the patient stated she was unable to leave the doctor's office until 2 p. m. She vomited several times while in the doctor's office. About five days after the injection she noticed that she could not see, the blindness was complete and the eye has remained blind since that time. The injection was not hot, but of the temperature of the room. If an injection of this kind under the skin was a common cause of optic nerve atrophy, we would have many cases of atrophy of the optic nerve. No doubt many members of this society have injected olive oil, lanolin and paraffin with varied success, but Dr. Fisher had never heard of a case of atrophy of the optic nerve following such injections. If this was a cause it is very uncommon. It is possible that some of the injected fluid could pass into the orbital cavity and cause pressure to be made upon the optic nerve, because we know that we find an occasional specimen in some museums that shows the ethmoid cells to be separated by a very thin bone and we can conceive of the cells to be joined by a congenital opening or we can

imagine some inflammatory process has broken down some thin wall and joined them, but such specimens must be very rare. It does not seem probable that such would be the case but when we have optic neuritis we should always examine the ethmoid cells and sphenoid sinuses. We know that suppuration of the frontal sinus might pass to the ethmoid cells and sphenoid sinus and cause pressure of the optic nerve.

When injections are made around the eyes pressure should always be made at the inner canthus at the time of the injection and for some time after to prevent the injected fluid from entering the sinuses of the face. The condition of the eye is as follows: Vision of the right eye is 20/20, the field and fundus normal. The left eye presents a picture of atrophy of the optic nerve. The pupil of the left eye does not contract when a strong light is thrown into it, but does contract when a strong light is thrown into the right eye. The nerve is white, the edges are sharply cut and well defined and the arteries are contracted; other than this the ophthalmoscopic findings are negative.

Dr. Thomas Faith saw a statement the other day which he believes was made by Lawford and which was to the effect that the location of the injury to the nerve could be determined to some extent by the time at which the blindness and atrophy of the nerve occurred, viz., when the injury occurs in front of the point at which the artery enters the nerve the blindness will be immediate and the pallor of the nerve head will be at once noticeable. Where the injury occurs back of the point of entrance of the artery the fundus may retain its normal appearance for several weeks after the injury; the blindness sometimes coming on immediately and sometimes being delayed for a time, but always preceding the symptoms of atrophy.

Dr. Faith could readily understand how a particle of this injected material could have been forced beneath the periosteum and if considerable force was used could have dissected its way under this membrane into the orbit.

He had made quite a number of injections of paraffin under the periosteum of the nasal septum for the relief of ozena and had been very much surprised at the rapid way it will sometimes dissect its way along.

Dr. Jos. C. Beck: He was much interested in this case. It is very easy to understand that if one takes a long needle and passes it directly into the eye or next to the eye and injects a large quantity of paraffin that it will compress the optic nerve and make trouble. In over 300 injections in different individuals around the nose and where the eyes would be endangered, he had never had such a result, in fact, no difficulty with vision. So far as the literature is concerned, he can assure Dr. Fisher that there is no authentic case to prove that anything like that can result from paraffin injection around the eyes. He was quite certain that this result could not have been from the injection.

The condition of the nose was not given in detail. Simple inspection of the nose could not show the presence of a sphenoiditis. Nothing short of an operation on the sinus, removal of the middle turbinate and opening of the sphenoid sinus would prove that this was not such a case.

Dr. O. Tydings hoped that some anatomist will trace the trouble or probable course of that fluid so that it would produce the pressure that led to the optic atrophy. It must be exceedingly rare. Dr. Tydings did not recall ever having seen a case or a report of such a case. We inject all sorts of things around the eye, nose and forehead. He would like to know the probable course of the fluid, and whether there might not be another law in effect here, one we are prone to forget, and that is the law of coincidence. Sometimes we have optic atrophy that is not easily explained. If this is the result of injection, it must be exceedingly rare.

IMPLANTATION OF GLASS SPHERE INTO CAPSULE OF TENON

Dr. Geo. F. Suker presented a negro child aged 3 years, with a marked and excessive sclero-corneal staphyloma, preventing closure of lids. Enucleation difficult because of adhesions. Inserted a lead-free glass sphere into capsule of Tenon, covered same with deep conjunctiva and muscles, bringing same together with

catgut sutures while the overlying conjunctiva was brought over this by a continuous silk purse-string suture. Reaction moderate, but sufficient to preclude any great motion of stump. Yet, there is a full socket thus avoiding the sinking in of the prothesis and the usual sinking in of the upper lid back of the shell.

There is no doubt but that the presence of the sphere in Tenon's capsule will materially aid the growth of the socket. It has been Dr. Suker's experience that some empty sockets in children do not attain the same size as the one having the globe, and since employing the implantations, this disparity in the size of the two sockets is not so marked.

DISCUSSION

Dr. W. F. Coleman did not have quite so good a result as Dr. Suker had in the implantation case. He had one case of sympathetic ophthalmia from the implantation of a glass ball in Tenon's capsule. He collected seventeen similar cases from the literature. Fox, of Philadelphia, is a great enthusiast in this work, and he reported three cases occurring in his own practice following the implantation of a gold ball which he prefers to the glass ball.

Dr. Coleman shall never again implant a globe of any kind. We can use the Snellen eye or we can inject stearin, from which he has never had any trouble nor had he seen any reports of trouble. It is possible that by using fat, as Dr. Suker has used it, we may not have any risk of sympathetic inflammation.

Dr. Wm. H. Wilder said when he observed the case of implantation of a glass ball in the capsule of Tenon, he could not help asking: "of what good is it?" There is not as much motion of the contents of the socket as there would have been if the ball had not been implanted.

When any foreign substance of an inorganic nature is implanted in the orbit, there is usually excited such an amount of irritation as to bind the muscles by adhesions and so to defeat the very purpose of such implantations, as in the present case.

If, when enucleating the eyeball, one is careful to keep the instrumentation within the capsule of Tenon, injuring the soft parts as little as possible, the wound in the socket heals promptly and the stump moves readily. He doubts that much motion will be transmitted to the prothesis that may be used in this case.

Some operators have had good results from the use of fat, taken from the gluteal region and implanted into the capsule of Tenon, and he saw some cases of this kind in Elschnig's clinic that were encouraging

But to his mind, the very slight improvement in cosmetic results obtained by implantation of balls of glass or any metallic substance are offset by the danger of irritation which is likely to be produced thereby.

Dr. Thomas Faith said he was not an advocate of the glass ball implantation, though he saw a case of Dr. Suker's a few years ago which was the finest result that he had ever seen. The case had been operated about three months before he saw it and the patient had not only good motion but had apparently good convergence with the operated eye. He thought that if the doctor persists in his attempts that he will eventually develop a method that will be both safe and satisfactory in all cases.

Dr. Geo. F. Suker (closing): Dr. Coleman cannot show a positive case of sympathetic ophthalmia due to the implantation of any sterile substance into the capsule of Tenon. It is impossible to get a sympathetic ophthalmia from any condition in a socket from which the globe has been removed. Dr. Suker looked up the literature carefully, and Dr. DeSchweinitz did the same and both were unable to find any record of such a case. If you remove an eye of a sympathetizing character and implant, and sympathetic opnthalmia should occur thereafter, do not blame the implantation. The trouble was there before the eye was enucleated.

When he enucleated this eye there were terrific adhesions all around, and he had to tear them loose in order to enucleate the eye, but the result was a better cosmetic one. In this case we have not much movement of the stump because of the enormous adhesions. There is a nice sulcus not too deep so that there will

not be a falling in of the upper lid. It may not give much more motion than could be gotten from an ordinary simple enucleation, but it will always avoid the sinking in of the upper lid. That is the important point in this class of cases.

Dr. Suker did not believe in evisceration and implantation in the scleral capsule. This capsule implantation does not take any more time than a simple enucleation, and the reaction is not much greater, the time of healing not much longer and the result is better than we get in a simple enucleation.

It is very gratifying to have had the seeming adverse discussion of Dr. Wilder, but if he will do the implantation he will find that notwithstanding this case, his results will be more satisfactory than those of a simple enucleation.

NUCLEAR PARALYSIS OF MOTOR OCULI

Dr. Geo. F. Suker presented a patient, Mr. K., aged 50 years, German, good habits, family history negative as to syphilis and tuberculosis, married, family grown; a painter for the past 15 years; working in lead and water colors; has had lead colic and moderate drop wrist several years ago.

About six weeks ago he noticed the drooping of the left upper lid. Within 24 hours he was unable to raise it, which caused him to seek advice. Upon examination a complete paralysis of the third nerve of the left eye was found, fundus normal, vision 20/20; no action whatever to muscles supplied by third nerve. The ptosis was complete and lid very flaccid. In every other respect all findings were negative.

The paralysis was not progressive in so far as the fourth and sixth were not implicated. The probable etiology is lead poisoning.

Under ascending doses of K. I. and Hall's solution of strychnin, improvement took place, though slowly, the branches for inferior and superior recti showing the earliest and most improvement. The iris now reacts to light and accommodation though slowly. Recovery may and may not be complete. The ptosis seems to be the slowest in showing recovery.

CONGENITAL CATARACT

Dr. Geo. F. Suker presented a patient, Chas. H., aged 11 years. Bilateral congenital cataract. The lens of each eye was needled once. The capsule was extensively lacerated, and iced compresses were used for 24 hours after the discission. Atropin was used daily. As soon as the reaction of the needling had disappeared, which was within a week or ten days, and the lens became uniformly opaque a corneal section in the lower quadrant was made with a keratome and the lens delivered. A clean and complete delivery was accomplished in each eye, with scarcely any remains of the anterior capsule but an intact posterior capsule, vision in each eye 20/15 with plus 11 and minus Jaeger 1 with plus 14 and binocular fusion.

The short period of time in securing safe removal of the lens and largest share of anterior capsule is an advantage over several discissions. Both eyes were operated on at intervals of four weeks.

CONGENITAL ABSENCE OF GLOBE, SMALL SOCKET AND BLEPHAROPHIMOSIS ON LEFT SIDE WITH A COLOBOMA OF IRIS DOWNWARD IN RIGHT EYE

Dr. Geo. F. Suker presented the patient, Bertha B., aged 11 years; was born with the foregoing conditions. The vision in right eye is 20/20. No other congenital lesions in the eye excepting a coloboma of iris about 4 mm. wide, extending from pupillary margin to the root of iris; the remaining uvea was not involved.

Down deep in the small socket of the left side, a whitish area is seen, which does not look unlike sclera, yet no mass can be outlined which might be taken for a cryptophthalmos. Parent will not permit the removal in order to determine whether we are dealing with a case of anophthalmos or cryptophthalmos.

Plastic measures are being employed to enlarge lid fissure in order to wear, if possible, a prosthesis.

A CASE OF BILATERAL PTOSIS

Dr. Clifford E. Smith (by invitation) reported a case, L. F., male, aged 28 years. Has been under observation six months. Inherited drooping lids from father. First trouble with eyes began ten years ago and was diagnosed "granulated eyelids" by an eye specialist. Patient's chief complaint has always been a circular pain in and about the eyeballs. At the time trachoma was diagnosed patient experienced sensation of sand in the eyes, and lids became swollen and more droopy. Has visited specialists in Chicago, Milwaukee, San Francisco, etc., getting glasses from the different ones, but at no time has circular pain about eyes ever been relieved. Denies lues. At present patient complains of circular pain about eyes, and inability to read over ten or fifteen minutes at a time. Bright lights hurt the eyes. There are no subjective symptoms such as scratching, burning, smarting or itching.

Findings on examination: R. upper lid droops covering upper one-half of cornea and pupil. L. upper lid covers upper one-third of pupil. Upper lids are thickened and slightly reddened externally. Conjunctivae of all four lids and fornices chronically injected, too moist and vessels overfilled; smears and culture from the same are negative. No scars are visible on conjunctivae. Ocular conjunctivae seem very loosely attached to bulbs so that on slight pressure upward on the lower lids the conjunctivae roll up in front of lid borders. Tension normal in both eyes. Lachrymal sacs are negative regular to pressure and patent to Anal's syringe. Pupils are equal, regular and react normally to light and accommodation. Anterior chambers are of normal depth. Discs slightly oval.

R. V. = 20/30; — 2.00 = + 1.75 Ax .90° = 20/20

L. V. = 20/30; — 2.00 = + 1.75 Ax .90° = 20/20

Present glasses were fitted under homatropin and patient wears them constantly. The eyes feel better with them on than off.

To sum up, we have a patient with a bi-lateral ptosis, mixed astigmatism, chronic catarrhal conjunctivitis, and loosely attacked ocular conjunctivae. He wears the correction for his astigmatism and has doctored long and faithfully for the conjunctiva irritation. However, the circular pain in his eyes has not been relieved and he is unable to use his eyes for any length of time for close work. Would some operation for ptosis be justifiable and what are the prospects for relief from this or other measures?

Question: Is there a relation between the ptosis and circular pain about the eyes? (He wears the correction for his astigmatism.)

A CASE OF FOREIGN BODY (PROBABLY COPPER) IN GLOBE

Dr. W. H. Wilder presented the case of Walter R., aged 8 years; foreign body in chorioid of right eye. Was watching a bonfire when a sudden explosion threw a large amount of dirt into his face. Aug. 27, 1912, fragments of copper were removed from the forehead. There was a small wound in upper part of cornea of right eye just below limbus. Hemorrhage in anterior chamber. T. m. After absorption of blood, iris was seen to be adherent to the small wound in cornea. Lens and vitreous clear. R. V. = 6/20.

Track of foreign body can be seen in the upper temporal part of eye ground, and a mass, probably encapsulated metallic fragment, is seen one disc diameter from the upper temporal margin of the optic disc. Skiagraph shows f. b. in posterior part of the eyeball, but attempts to dislodge it with magnet have failed.

Present condition: Eye quiet. R. V. = 6/10, L. V. = 6/ 10.

GUMMATOUS SCLERITIS—EPISCLERITIS—IRITIS

Dr. W. H. Wilder presented case, Miss C. T., aged 21 years, who for the last two years had attacks of inflammation of left eye lasting from one to several weeks.

First seen March 1, 1912, when a large, yellowish hemispherical nodule about 5 mm. in diameter was seen on the nasal side of left eyeball 6 or 8 mm. from the limbus. It was rather firm and slightly attached to the sclera. This began as a

pinhead sized nodule two months previously. On upper part of eyeball an episcleritic node was present. Pupil irregular from post. synechiae.

Tuberculin test (von Pirquet) was positive.

Inoculation of eyes of two rabbits with small particle removed from the growth was negative.

Wassermann test distinctly positive.

R. V. 6/6. L. V. 1/60. Under treatment with mercury inunction and K. I. the growth completely disappeared.

Present condition: R. V. 6/6. L. V. F. 1 ft.

Fundus invisible.

CASE OF INVERSION OF IRIS AND PARTIAL DISLOCATION OF THE LENS

Dr. Charles G. Darling presented the case of Mrs. C., aged 52 years, who came to the clinic on account of an ulcer of the cornea.

Examination of the left eye showed corneal ulcer near margin, inversion of iris and partial dislocation of lens. Patient said that 45 years ago she had a blow on her left eye and the pupil had been large and she had not seen well with eye since then.

One would expect to find the lens opaque after being partly dislocated for so many years.

The fundus can be plainly seen; there is a rupture of the chorioid and a circumpapillary atrophy of chorioid. Tension is normal. L. V. = hand movements.

CASE OF PROBABLE TUBERCULAR SCLERITIS

Dr. Charles G. Darling presented case of Mrs. C. C., whose history is negative, with exception that she has nursed husband past two years, who is at home on account of pulmonary tuberculosis.

First seen September 18. She stated eye had been inflamed for a number of weeks. Examination showed a marked scleritis of left eye, with involvement of ciliary body, iris and cornea. An injection of 1/1000 mg. of T. B. was followed by a local reaction 24 hours later; all the following injections, about a dozen in number, given at intervals of four or five days, were followed by a local reaction. The case has improved under treatment of injections of T. B. and local use of atropin, dionin and hot applications.

As the patient had a local reaction in left eye following every injection of T. B., Dr. Darling believed the case to be one of local T. B.

PENETRATING INJURY OF GLOBE BY FRAGMENT OF COPPER, FOLLOWED BY LOSS OF EYE

Dr. Charles G. Darling reported case of a young man aged 14 years, hit in right eye while passing some boys throwing stones at blank cartridges. On examination three days later he found a cut in cornea, the fundus could not be seen on account of a traumatic cataract. *X*-ray picture taken by Dr. Potter located foreign body at posterior pole of eye partly sticking through sclera. After cutting external rectus and rotating eye as far in as possible, foreign body could not be felt or seen at posterior pole of eye. Eye was removed and foreign body found to be of copper and in posterior pole of eye.

A CASE OF PERSISTENT PUPILLARY MEMBRANE

Dr. Rochester (for Dr. Casey A. Wood), reported a patient, aged 29 years, who had never been aware of the abnormal condition of his eye. He presented himself for treatment because of symptoms brought on entirely by his high degree of hypermetropia. No history of iritis or any other inflammatory disease of the eyes.

Examination disclosed a small band of tissue running from the anterior surface of the iris looping well forward into the anterior chamber and attaching itself to the lens capsule. As is usual in these persistent membranes the point of attach-

ment on the iris is well back from the pupillary edge at the region where the embryonic vessels for nourishing the pupillary membrane formerly arose. At the point on the anterior capsule, where the final attachment is made, is seen a small white deposit, probably a remnant of the fetal vascular capsule of the lens.

These persistent pupillary membranes are usually of little significance to the patient for they seldom, if ever, give any trouble and very slightly interfere with vision. With the proper correction, this patient's vision is practically normal.

AN INTERESTING CASE OF PRIMARY GLAUCOMA

Dr. Thomas Faith presented case of Mrs. J. H., aged 29 years, of Swedish parentage, and apparently in good general health. Was first seen on September 30, with the following history: For many years she has noticed that her eyes have appeared tired looking particularly at night and after loss of sleep, and she has had occasional attacks of photophobia, but the vision has always been good until the present trouble developed.

In January of the present year while doing a family washing she was taken with a severe headache which lasted all day and towards evening both eyes began to pain severely; and in a short time became very red and swollen. A physician was called who diagnosed the condition as an attack of pink eye. He prescribed hot boric compresses and some internal treatment but was obliged to administer morphia before the pain was relieved. Patient remained in bed constantly for four weeks during which time both eyes remained red, the right worse than the left, and during which time she had attacks of blindness affecting first one eye and then the other and for one day, the patient states, she seemed completely blind in both eyes. During the next four or five weeks she remained in the house and was seen by two different physicians—the treatment of the eyes seemed to be always the same. Finally the left eye began to clear up and the right eye remained red for about three months. At this time she was taken to a local optician who prescribed glasses, which were changed five or six times; nothing in the way of local treatment was given until about September 1, when the patient came under the care of Dr. Abernathy Graves of this city. Dr. Graves immediately made a diagnosis of glaucoma and began treatment with myotics. At this time eserin in most any strength caused so much discomfort that Dr. Graves referred the case to Dr. Faith for further treatment.

When first examined September 30, Dr. Faith found R. V. light perception only; L. V. 20/50. Right pupil widely dilated and inactive T. R. E. with palpation plus two, with the Schiotz tonometer 70 mm. Hg. marked glaucomatous excavation of optic nerve, slight beginning lens opacity, the anterior scleral veins were distended and tortuous, though the sclera seemed unusually white. Could not take the field. The left eye showed the pupil dilated more in the vertical than in the horizontal meridian and reaction sluggish, anterior scleral vessels gorged, anterior chamber shallow, T with palpation plus one, with the Schiotz tonometer 42 mm. Hg. Distinct cupping of the nerve head of glaucomatous character. Complete urinalysis was made and shows deficient quantity, about 40 oz. per 24 hours. Sp. Gr. 1.015; urea 1.1 per cent.; total solids 3.4 per cent.; acidity 27 degrees; a trace of albumin; a trace of bile; no indican; hyalin casts; a few red blood-cells and a few pus cells. The patient's blood-pressure at this time was 110 to 120. Her digestion was apparently normal, and menstruation was normal but scant.

A solution of eserin sulphate, 2 grains to the ounce, was ordered but could not be used on account of pain which it produced; it was then reduced to 1 grain to the ounce, which also caused pain and had to be further reduced to one-half grain to the ounce. This weak solution could be tolerated all right though slightly painful, but seemed to have no effect whatever on the pupil or the tension, particularly in the right eye. The visual field taken at this time showed practically the same features as the one taken when the eserin was first ordered. Also the tonometer reading a. e. 40 to 42 mm. Hg. in the left eye and 68-70 mm. Hg. in the right. On October 10 he injected 15 m. of a 5 per cent. solution of sodium citrate under the conjunctiva of the left eye and on the 11th, the same amount was

injected in the right. The immediate effect of these injections was a lowering of the tension in both eyes. The right tension being lowered to about 52 mm. and the left to 25-27 mm. These injections, however, were so painful that the patient begged me to discontinue them, which was done. Then he returned to the eserin solution, and since that time has used the 1 grain to the ounce solution without any discomfort whatever. The pupils are both much smaller now, that of the left eye being almost normal and the patient expresses herself as feeling much more comfortable than at any previous time since the trouble began. The vision right eye is now, October 19, hand movements at 10 ft., October 21, —20/200, and the tension October 19, R. T. = 60 and L. T. = 27, and at last reading was 37 mm. The vision L. E. is 20/30 and the tension at last reading was 20-22 mm. Dr. Faith had promoted elimination constantly by the use of sodii phosphate and lithium citrate. What further treatment should he adopt, if any, and should he operate?

There are several interesting features in connection with this case. First the age, according to Knapp's tabulation, he found in 352 cases the following results as to age: From 10 to 20 years, 3 cases; from 20 to 30 years, 11 cases; from 30 to 40 years, 28 cases; from 40 to 50 years, 60 cases; from 50 to 60 years, 130 cases; from 60 to 70 years, 89 cases; from 70 to 80 years, 28 cases; from 80 to 90 years, 3 cases.

This patient then is young to have glaucoma and according to Knapp's table comes within the age group which comprises 3½ per cent. of the entire number of cases.

Then of considerable interest is the kidney findings which show that we have here either a renal insufficiency, a slight nephritis, or a renal edema, and which bears out the ideas of a number of observers who, as A. Terson puts it, believe that glaucoma is a localization of other processes in the organism, that it is nothing more than an edema in a closed cavity. That the hypertension is only a symptom and not the disease itself. Terson gives various predisposing factors such as heredity, female sex, Jewish race, gout, nervous affections, cardiac and circulatory disturbances, chronic intoxications and various other causes among which he gives particular prominence to high blood-pressure, arteriosclerosis and symptoms of renal impermeability. He further says that as a consequence of renal insufficiency there will be a retention of chlorids in glaucoma and that therefore a dechloridation treatment is indicated. He thinks that acute attacks of glaucoma may be due to sudden raising and lowering of blood-pressure, but that this is by no means always the case and that the blood-pressure is more likely to be constantly high than otherwise.

DISCUSSION

Dr. William A. Fisher: Dr. Faith's inquiry whether he should continue with the eserin or whether he should give more citrate of soda seemed to Dr. Fisher an easy problem. Dr. Faith had said that the citrate of soda had put the patient in a condition where the eserin gave him good results and the eserin did not give the good results before the citrate of soda was injected. The only reason he discontinued the citrate of soda was on account of the pain following the injection. In painful cases, as this one, Dr. Fisher did not see any harm in injecting a weak solution of cocain under the conjunctiva before injecting the citrate of soda and he suggested that more cocain be used before injecting the citrate of soda and then continue the eserin if necessary.

Dr. O. Tydings had used citrate of soda at first with good result in a case of traumatic glaucoma and he thought he was getting good results. The first thing he knew he had an increase of tension, and he has been a little more careful with it since. He had a case of glaucoma in a patient younger than Dr. Faith's patient, who went to the infirmary. She reported that she had been blind for two years following the fitting of a pair of spectacles in the infirmary. The patient was 24 years old and had been blind in the right eye for two years from glaucoma; the left eye was beginning to be affected. It was difficult to control conditions, and for the woman's own safety he advised her to go to the Michael Reese Hospital. He has had no record of her since, although he has asked Dr.

Mortimer Frank to look up the case for him. The urine was examined but he did not recall the report now. He was unable to determine the cause of the glaucoma.

PENETRATING WOUND OF SCLERA-CORNEA REPAIRED WITH CONJUNCTIVAL FLAP

Dr. Richard J. Tivnen presented a case of a man, aged 24 years, who one month previously had received a penetrating injury from a piece of steel at the sclera-corneal junction at about the location of six o'clock. When patient was seen four days later, examination disclosed an incised wound of sclero-cornea with an incarcerated iris and a minute opening at the lower angle of the wound through which the vitreous constantly oozed. Radiograph and electric magnet, negative. History also clearly indicated that the foreign body was not retained in the globe. The wound was repaired by dissecting a conjunctival flap around the entire circumference of the cornea and drawing this over the wound and securing same with a purse-string suture. The patient was exhibited as an illustration of the satisfactory results one may obtain in utilizing a conjunctival flap as a splint and protection against infection in this class of injuries.

CASE OF PENETRATING WOUND OF CORNEA FOLLOWED BY TRAUMATIC CATARACT

Dr. Richard J. Tivnen presented a case, L. J., who about two months previously, while at work, was struck in the right eye by a piece of steel. Examination of right eye, 24 hours later, disclosed incised wound of sclera-corneal junction, nasal horizontal meridian, 5 mm. in extent. The iris was incarcerated in the wound. The lens was cataractous and some of the swollen lens material was present in the anterior chamber. While the history pointed to the absence of a retained foreign body a radiograph was taken and the electric magnet applied; both with negative result. Perception and projection, excellent, tension, normal. The case was presented to gain an expression from the members as to their practice in dealing with a cataract of this type. Dr. Tivnen, in the present case, while recognizing that the swollen lens material might, by traction or pressure, inaugurate a keratitis, an iritis or a glaucoma, had refrained from operative interference owing to the fact that the patient was constantly under his observation and that the eye presented no evidence of irritation or increased tension. In his judgment, as long as the progress of the eye is favorable and uncomplicated he felt justified in continuing his present conservative plan of management.

DISCUSSION

Dr. C. F. Burkhardt had had a case similar to Dr. Tivnen's but there was no penetrating wound. His patient was a boy nine or ten years old. The cause of the injury to the lens was a shot from an air gun which struck the cornea with sufficient force to rupture the lens capsule and dislocate the lens into the anterior chamber. He treated the patient conservatively and the lens was entirely absorbed. The boy now has something like 6/20 vision with correction. Only a tiny shred remains, probably of the capsule.

RICHARD J. TIVNEN, Secretary.

EFFINGHAM COUNTY

The regular monthly meeting of the Effingham County Medical Society was held at the City Hall at 1:30 p. m., Jan. 14, 1913, with Dr. Taphorn in the chair. Minutes of the last meeting were read and approved. Reading of correspondence from Mr. Mayen regarding Medico-Legal fund. A motion that a committee of five be appointed to investigate communication and report at the March meeting was made by Dr. Haumesser and seconded by Dr. Wettstein. Discussed by Drs. Hoffman, Bing, Haumesser, Damron, Buckmaster. Committee appointed by the president was Drs. Haumesser, Brooks, Damron, Wettstein and Bing. The president appointed the following committees:

Program and Science—Drs. H. Taphorn, Effingham; E. A. Bing, Altamont, and L. C. Bassett, Effingham.

Public Press—Drs. F. Buckmaster and E. L. Damron, Effingham, and J. G. Allan, Edgewood.

Legislation—Drs. Geo. Haumesser, Shumway; T. J. Dunn, Dietrich, and E. W. Brooks, Beecher City.

Library and Post-Graduate Study—Drs. F. W. Goodell, Effingham; Weisenbron, Teutopolis, and J. C. R. Wettstein, Effingham.

Public Health and Hygiene—Drs. S. C. Lorton, Shumway, S. F. Henry, Effingham, and W. P. Tinsley, Beecher City.

Medical Economics—Drs. F. N. A. Hoffman, Effingham; J. B. Holson, Farina, and I. B. Tope, Montrose.

Banquet and Entertainments—Drs. J. H. Walker, C. F. Burkhardt, and C. C. Holman, Effingham.

Medico-Legal—Dr. E. W. Brooks, Beecher City.

Membership—Drs. Haumesser, Kershner, Brooks.

Dr. E. L. Damron gave a talk on "Politics and Legislative Needs," recommending a coming together of societies and doctors and the formation of a legislative association in the state, also the support of organizations already formed. Paper by Dr. Haumesser on "Wills."

At this point the speaker of the day, Dr. J. B. Murphy, of Chicago, arrived and was introduced by Dr. C. F. Burkhardt. Dr. Murphy held the doctors spellbound by his most able and instructive presentation of the "Treatment of Acute Bone Infections in Relation to the General Practitioner."

Dr. Murphy had with him an abundance of *x*-ray photos showing conditions and results he has attained which could not help but convince the most skeptical.

This without exception was the largest and most helpful meeting Effingham has been favored with. There were some 34 members and visitors present. Among the out of town doctors and friends present were: Dr. J. R. Scott and wife of Edgewood, Dr. Tope of Montrose, Drs. W. E. Franke, W. A. Robb, Yelton, Schmidt of Newton; Drs. F. M. Phifer and H. E. Wilson of Centralia, Drs. Andy Hall and L. C. Morgan of Mt. Vernon, Dr. J. Y. McCullough, Dr. W. H. Staltz, Rev. Beboat and Mr. Thompson of Casey; Supt. of Poor, J. W. Davis, and our dentist friends Drs. Bellchambers, Cunningham and Hill of Effingham; Paul Eiche our druggist, and Geo. M. LeCrone of the *Morning Record*. The regular members present were Drs. Damron, Haumesser, Buckmaster, Wettstein, Holman, Hoffman, Lorton, Bassett, Bing, Taphorn, F. W. Goodell, Burkhardt and Henry.

In the evening Dr. Murphy gave an address at St. Anthony's Hall to an audience of about 500 interested people. There was much enthusiasm shown and this address bids fair to have a lasting effect on the community for better health.

DR. BASSETT Secretary.

JACKSON COUNTY

The Jackson County Medical Society held its monthly meeting December 27, 1912, in the Jackson Club Rooms, Murphysboro. The following new members were added to the roll: Drs. Busse, of Campbell Hill; Stearns of Pomona; Chamness, of Elkville, and Hrabik and Minner, of Murphysboro.

The following officers were elected to serve during the ensuing year: president, Dr. House, De Soto; vice-president, Dr. Barrow, Carbondale; secretary-treasurer, Dr. Hrabik, Murphysboro; delegate, Dr. Grizzell, Murphysboro; alternate, Dr. Mitchell, Carbondale.

LAKE COUNTY

A very interesting meeting of the Lake County Medical Society was held Jan. 9, 1913, at the Public Library, Waukegan. The society was highly honored and pleased by the presence of Dr. Frank Billings of Chicago, a man of national if not international fame, professor of the practice of medicine at Rush,

a member of the Illinois Board of Charities, and ex-president of the American Medical Association. After a short business session in which seven members were elected, making a total membership of fifty, and appointment of important committees, Dr. Billings gave an informal talk for half an hour relating the result of several years of original clinical research work and the successful treatment with autogenous vaccines of many difficult and obscure cases in which the usual methods of treatment had failed. He then read a paper for another half hour, describing the remarkable success attending the use of a new remedy, benzol, in a number of cases of leukemia, after the usual methods of treatment by the *x*-ray and other means had given only partial success. This was simply the preliminary report of cases which he will give fully later to the profession.

Dr. Foley made a few remarks concerning the International Congress of Demography and Hygiene at Washington which he attended last fall.

Dr. Bouton read a paper on "Preventive Medicine," telling about the causes and methods used to prevent the spread of typhoid fever, diphtheria, scarlet fever, pneumonia and tuberculosis. The article, which covers the most important contagious diseases of foreign lands as well as our own, will be published in the ILLINOIS MEDICAL JOURNAL, probably in March.

The members then went to the Hotel Washburn where an excellent supper was served and then the following responses to toasts were given with Dr. Roberts of Highland Park, president of the society, as toastmaster: "The Doctor and the Minister," Rev. J. B. Richardson; "The Doctor and the Lawyer," Commissioner Diver; "The Doctor and the Teacher," Superintendent Thompson; "The Doctor and the Public," Dr. Bergen of Highland Park, introduced as the "silver-tongued orator of the north shore," certainly a well merited title. Thirty-three physicians attended the supper; twenty-three from Waukegan and North Chicago and two from Wauconda. The next meeting will be held early in April at Highland Park

MARION COUNTY

Marion County Medical Society held its regular meeting in the City Hall at Centralia, Illinois, Friday, Dec. 27, 1912, with Dr. Geo. S. Rainey in the chair. The following members were present: Drs. H. L. Logan, W. W. Murfin, S. E. Peden, J. M. Haney, H. D. Gillette, W. D. Richardson, J. W. Armstrong, J. C. Hall, W. D. Murfin, H. W. Brann, H. E. Wilson, W. A. Stoker, T. J. Foster, O. D. Deihl and F. M. Phifer.

The minutes of the previous meeting were read and approved. Report of treasurer read and approved.

The applications of Drs. J. W. Gambill and S. A. Smith were presented and both were unanimously elected to membership. The following officers were elected for the ensuing year: president, Dr. W. W. Murfin, Patoka; vice-president, Dr. Geo. S. Rainey, Salem; secretary-treasurer, Dr. F. M. Phifer, Centralia.

Dr. C. N. Dunn presented a paper on "Fresh Air and Sunshine." Dr. F. M. Phifer presented a paper on "The Advancement of Surgery." Both of these papers were discussed freely by several of the members.

On motion the meeting adjourned to meet in Centralia Feb. 28, 1913.

MASON COUNTY.

The regular meeting of the Mason County Medical Society was held Jan. 6, 1913, at Mason City Hall. The president being absent Dr. Burnham was elected to the chair. Minutes of previous meeting were read and approved.

Dr. Minnick of Mason City read a paper on "Anascara, with Special Reference to Heart Lesions." The doctor handled the paper well, giving in detail etiology, symtomatology, pathology and dwelling on the various modes of treatment. The paper was then discussed at length. Dr. Caton of Mason City was on the program for a paper, but was detained on account of sickness.

A program committee was appointed for the year by the president as follows: Drs. H. O. Rogiers, Mason City; M. A. Weight, Manito; E. W. Paul, Forest City; F. F. Garrison, Havana, and W. R. Grant, Easton, Ill.

The following new members were elected to our society: Drs. M. E. Langston, Bath; Wm. H. Schuette, Mason City, and Dr. Hanson, Easton, Ill.

Officers elected for the year 1913 are as follows: president, F. F. Garrison, Havana; vice-president, L. F. Burnham, Mason City; secretary-treasurer, W. R. Grant, Easton.

Those present at the meeting were Drs. Garrison, Rogier, Cargill, Schuette, Hanson, Walker, Burnham, Minnick and Grant.

M'DONOUGH COUNTY

The first quarterly meeting of this society was held Jan. 7, 1913, at Macomb, with a majority of the physicians of the city in attendance, and some from Bushnell, Bardolph and Prairie City. Other members throughout the county were unable to attend on account of the inclemency of the weather.

One of the principal topics of the evening under discussion was given by Dr. S. S. Allen of Macomb, who took for his subject, "Middle Ear Deafness." Dr. Allen discussed the cause and stated that the majority of cases of deafness could have been cured had they received the proper treatment and if tended to when the person was young; if the adenoids, tonsils and other nose and throat troubles were looked after in time.

Dr. Nickerson of Quincy, president of the State Medical Society, in his paper on "Pneumonia," laid special stress on the fact that in order to save the greatest number of pneumonia victims one must keep the general health up to its highest standard. Dr. Nickerson's presence at the meeting was highly appreciated by the members of the society and he proved himself a man well worthy to fill the high position to which he has been elevated.

At the close of the meeting the members enjoyed a lunch at the Grand Café. The next meeting will be held in April, at Bushnell.

MORGAN COUNTY

The postponed annual dinner and January meeting was held January 16, at "Maplecrest," the new property which is to be used by Dr. Elmer L. Crouch in connection with Maplewood Sanatorium. Dr. and Mrs. Crouch as usual proved their ability as delightful host and hostess.

After the dinner Dr. F. A. Norris, the new president, introduced Dr. Malrolm A. Bliss of St. Louis, who presented a subject upon which he and Dr. Greenfield Sluder have been working for some time, namely, "The Relations of the Fifth Cranial Nerve to the Bony Sinuses of the Skull."

From the examination of a number of heads, postmortem anomalies of the various sinuses have been found and resulting anomalies of position of the fifth nerve and its relations to the sinuses have been demonstrated. In some cases all three branches of the fifth nerve have been found to be in close relation to diseased sinuses.

Dr. Bliss and Dr. Sluder think that many cases of tics and dull headaches which are unexplainable are probably due to the close proximity of the fifth or other nerves to abnormally extending sinuses that harbor infection. The cavernous sinus perhaps suffers most in its frequency of being abnormal. At times the sphenoidal may much encroach upon its outer wall. Some pain complexes may be explained in congenital malformations plus postethmoidal sphenoidal sinus disease.

All pain complexes are not to be explained by this relationship of nerve to sinus. On the other hand examination of the ganglion and of the root have not succeeded in clearing up all of the cases.

Removal of the ganglion is a formidable procedure, while alcohol injection promises just so much and when the pain returns can be repeated.

Dr. Bliss and Dr. Sluder are making many observations on living as well as dead subjects and are striving along with others to get at the bottom of the matter, to reduce the unexplainable cases to the minimum.

The subject was well received as evidenced by the free questionings and discussion which followed.

The members present were: Drs. Adams, Baker, Black, Bradley, G. R., Bowe, Cole, Crouch, Day, J. U., Dewey, Duncan, Foley, Gailey, Gregory, Hairgrove, Hardesty, Haskell, Milligan, McLaughlin, Norris, Ogram, Pitner, Reid, Stacy, Thompson, Wakely and Woltman.

Guests of the society were Drs. M. A. Bliss of St. Louis; W. H. C. Smith of Godfrey; C. U. Collins, Robert Hanna, Peoria; W. S. Taylor, J. A. Glenn, Ashland; C. R. Thomas, Roodhouse.

The clinical and laboratory diagnosis of tuberculosis will be presented at the February meeting on the 13th, by Drs. Charles E. Cole and Grace Dewey.

GEORGE H. STACY, M.D., Secretary.

PEORIA COUNTY

The election of officers, annual committee report and an address by Dr. W. B. Short, retiring president, featured the meeting of the Peoria Medical Society, at the Association of Commerce rooms, Tuesday, Dec. 17, 1912.

An interesting number on the program was the demonstration of the pulmotor, an instrument for use in cases of drowning, gas asphyxiation, or stopping of the respiration from any cause.

The following were elected as officers for the coming year: president, B. M. Hayes; first vice-president, Sumner M. Miller; second vice-president, C. D. Thomas; secretary-treasurer, E. W. Oliver (reelected); board of censors, Edward Hasson, R. E. Kerr, and C. B. Welton; delegate, C. H. Brobst.

PERRY COUNTY.

The Perry County medical Society held a meeting Jan. 13, 1913, and elected the following officers for the coming year: president, Dr. Max Adles, Duquoin; first vice-president, Dr. J. S. Templeton, Pinckneyville; second vice-president, Dr. J. S. Cleland, Swanwick; third vice-president, Dr. H. W. Wolf, Tamaroa; fourth vice-president, Dr. James T. Leight, Duquoin; secretary-treasurer, Dr. Rolla D. Pope, Duquoin.

SANGAMON COUNTY

The regular monthly meeting of the Sangamon County Medical Society was held Jan. 13, 1913, at the Lincoln Library, the officers were elected for the ensuing year and are as follows: president, D. M. Ottis; vice-president, Chas. D. Wright; secretary-treasurer, H. C. Blankmeyer.

STEPHENSON COUNTY

The Stephenson County Medical Society held its annual meeting at the court house Thursday. The attendance was very large and the interest manifest was encouraging to those who had planned the meeting. A number of doctors from towns in this and surrounding counties were in the city for the meeting.

Officers for the ensuing year were elected as follows: president, Dr. Chas. L. Best; vice-president, Dr. J. A. Poling; secretary, Dr. J. Sheldon Clark; treasurer, Dr. Nelson C. Philips; censor, Dr. Guthbert J. Leavy; delegate to the state meeting at Peoria, Dr. K. F. Snyder; alternate, Dr. J. A. Poling.

Mr. Theodore W. Singer, who has been in Stephenson county for several days, acquainting himself with the local medical situation, was present at the meeting and gave a very interesting talk to the members. Mr. Singer represents the

American Medical Association and is surcharged with enthusiasm and the possibilities of the work that he is called upon to do.

Among those present were the following: Drs. Arnold, Best, E. H. Best, Chas. L. Best, Burns, Clark, Hutchins, Linda K. Karcher, Mease, Poling, Peck, Rideout, Saucerman, J. W. Stealy, R. J. Smith, Snyder, Thompson, Phillips, Harlan, Hewetson, Wilson, A. A. Leavy, Collins, Pettipiece, Diestlemeier, Stiver and the following visitors: Dr. G. M. Tyrrell, of Scales Mound, Dr. O. F. May of Shannon. Several of the graduate nurses of the city were in attendance.

The program was given as follows:

"The Physiological Effects of Cecale Cornutum," Dr. A. E. Smith.

"Treatment of Pneumonia," Dr. Chas. L. Best.

"Vaccine Therapy," Dr. J. H. Stealy and Dr. N. R. Harlan. (Illustrated by the stereopticon.)

The paper on vaccine therapy, by Drs. J. H. Stealy and N. R. Harlan, was of a very high order. This paper could well bear another hearing, for the work put forth in its preparation was considerable and the deductions of the essayists were logical. There is no doubt, as shown by the paper, but that in many acute diseases we are prone to use this or that vaccine with little regard as to the sort of receptors that are awaiting them.

Dr. A. E. Smith's paper on the "Deleterious Effects of Ergot on the Unborn Child," was well received. The doctor reported a series of cases that he had observed for a period of years, of offspring of mothers who had attempted to produce an abortion sometime during the gestatory period by taking large doses of ergot. These children observed by Dr. Smith were without exception much below normal, having all manner and kind of stigmata.

Dr. Charles L. Best's paper on the "Treatment of Pneumonia," deals especially with the use of massive doses of quinin and urea-hydrochlorid, as recommended by Dr. Solis-Cohen.

This paper brought out a great deal of discussion, both of the use of the quinin and other points of general interest in the treatment of pneumonia.

Dr. D. C. L. Mease in discussion spoke of the rise and fall of many lines of treatment advocated during his experience covering a period of thirty years. It was the doctor's opinion that so far, we had no definite line of treatment for pneumonia as such, but that every case is a problem of itself.

Clinical Cases. Report of the successful passage (via naturales), of a silver half dollar that had been swallowed by a ten-year-old lad, with *x*-ray pictures showing the coin at various points in the esophagus, Dr. J. Sheldon Clark

Case of Unilateral Congenital Cataract, Dr. E. H. Best.

The use of the stereopticon in making clear certain points in the paper on vaccine therapy made a good impression with the hearers. The society is not for a moment considering the advisability of competing with the "movies," but this method of exemplification of medical topics is very commendable.

WILL COUNTY

Twenty-nine members of the Will County Medical Society sat down to dinner at the Commercial Club, December 17, at Joliet. After dinner the election of officers took place, which resulted as follows: president, A. J. Lennon; vice-president, G. M. Peairs; secretary-treasurer, Marion K. Bowles; members of the Board of censors, Alfred Houston and V. J. Cohenour; delegate to the state convention, V. H. Curtis, Wilmington; alternate, William K. Bowles; member of medicolegal committee, Wm. Dougall; member auxiliary league, American Medical Association, Dr. William Richards.

Addresses were given by Dr. M. L. Harris, Chicago, who gave a stereoptican lecture on the "Treatment of Fractures," and Dr. E. P. Ryerson, Chicago, spoke on the "Affections of the Sacro-Iliac Joints." A general discussion was also held.

The society elected to membership ten physicians: Drs. E. J. Abell, Alfred Houston, Grant Houston and Schreffler of Joliet; W. B. Welch, Marshall Cassingham of Wilmington; Hedges, Frankfort, Turner, Holke and Howe of Peotone.

NEWS OF THE STATE

NEWS ITEMS

—The Drs. Weber, of Olney, recently completed the addition to their sanitarium at a cost of $20,000.

—Dr. Edwin Pynchon has sent in to the Bennett Medical College his resignation as Professor of Rhinology and Laryngology.

—The Chiropractors of Indiana, forty in number, have perfected an organization for the purpose of securing recognition of that cult by the General Assembly at its present session.

—The new City Hospital at Paris, Ill., was opened January 15. There are twelve beds in the building, and all the equipment including operating rooms are thoroughly up to date.

—Professor Morganroth, of Germany, announces that he has discovered a specific remedy for pneumonic infection in the chemical compound known as ethylhydrocupreinhydrochloride.

—St. Clara's Hospital report, at Lincoln, shows that 616 persons were cared for during the year 1912; 210 operations were performed and thirty deaths were recorded. At the beginning of the present year there were fifty-eight patients in the hospital.

—The Aurora Hospital Association reported during the year 1912 receipts of $17,942.91, and expenditures of $13,701.99; and after paying all debts, will have a comfortable balance in the treasury. Five hundred and thirty people were admitted during the year.

—Dr. J. H. Farrell, 93 years of age, and the only surviving member of a prominent family that lived in Peoria fifteen years ago, was picked up on the streets clothed in rags and half frozen to death, with a request to be taken to the asylum. Dr. Farrell was formerly possessed of unusual ability as a physician, but his desire to roam was his undoing.

—Dr. S. Weir Mitchell will deliver an address on "The Profession of Medicine in the War of the Rebellion" at a banquet given in his honor by the Physicians' Club of Chicago, at the Hotel La Salle, Tuesday evening, February 25. Members of the Chicago Medical Society, Illinois Medical Society and the Chicago Neurological Society are invited to be present.

—Nine doctors and persons arrested in a nation-wide crusade on illegal practices, inaugurated some time ago by the federal authorities, must stand trial on indictments pending against them. Demurrers to the true bills were overruled by Federal Judge Carpenter, following arguments. The following were arrested: Joseph J. Milosch, Walter D. Munn, W. Hubert Miller, George T. Leedle, John C. Message, Felix C. Hartung, James C. Doyle, Arnold E. F. Hasenclever, Margaret Livingston.

—County Judge P. L. Persons, of Waukegan, has ordered that one John McQueen, a 16-year-old boy, whose parents reside in Zion City, is entitled to medical attention, despite the fact that his parents both believe in divine healing. The decision is of special interest because of the cases at Zion City, where medical attention was not given persons who afterward died. An older brother of McQueen filed a petition alleging his brother had been having trouble with adenoids.

—Ward Robinson, secretary of the state civil service commission, announces a list of employees of state hospitals, formerly assistant physicians, who have passed the examination of October, promotional for physician. The list of successful candidates and the hospital where they are now stationed, follows: Clifford C. Ellis, Robert H. Rea, K. M. Manougian, Barnet Lemohen, Chicago. Henry L. Krafft, George W. Brook, Thomas C. McLin, Peoria. Charles Rocksher, Samuel L. Gabby, Earl B. Jewell, James T. Rooks, Chas. R. Lowe, Drury L. Fish, Elizabeth D. Carroll, Kankakee. Wm. R. Tutt, Anthony G. Wittman, Oliver F. Hughes, Elgin. Esther H. Stone, Wm. H. Gambill, Watertown.

—The annual meeting of the medical staff of Passavant Hospital, Jacksonville, Ill., was held December 27. Reports of committees and officers were read, and a cabinet was displayed showing *x*-ray work in the hospital during the last two years. A report of the milk-supply was also given. A committee was authorized to look after the matter of arranging for increasing the clinical facilities of the hospital, so that the profession will have better opportunities for study. The election of officers follows: President, Dr. A. L. Adams; clerk, Dr. Grace Dewey; members of medical board, Dr. H. C. Woltman and Dr. C. E. Cole; medical trustees, Drs. H. C. Woltman, C. E. Cole, J. A. Ogram, A. R. Gregory, E. L. Crouch and A. L. Adams; dean of training school, Dr. Carl E. Black.

PERSONALS

Dr. Chadwick has located at German Valley, Ill.

Dr. William O'Rielly, of Canton, has removed to Winchester, Ill.

Dr. M. Harris, of Newton, Ill., has located in Harrisburg to practice his profession.

Dr. J. S. Thrailkill, of Bethalsto, will move to Alton and engage in the practice of medicine.

Dr. H. C. Parker, of Indiana, has opened an office for the practice of medicine at Pecatonica, Ill.

Dr. J. W. Calvert, of Dwight, has taken up his residence in Bloomington, and will practice there.

Dr. L. M. Bowman has sold out in Snyder, Okla., and, with his family, is again living in Alton.

Dr. Otto Hauser, who recently moved to Litchfield, has returned to his old practice at Walshville, Ill.

Dr. C. B. Horrell, of Galesburg, is an active candidate for mayor of that city on the Peoples Party Ticket.

Dr. Guy, who recently disposed of his practice in Woodstock to Dr. West, is about to locate at Lincoln Neb.

Dr. Clendenen, of Fulton, is out with a petition for appointment as superintendent of the Watertown Hospital.

Dr. E. M. Rundquist has returned to Rockford to practice, after having spent several years at Missoula, Mont.

Dr. F. Doyle, of Chicago, has located in Jerseyville, Ill., and has established offices in the State Bank Building.

Dr. S. J. Beeson, Chicago, has left for a trip to Australia and New Zealand, returning home via Buenos Ayres and Rio de Janeiro.

Dr. Fred Brian, of San Jose, Ill., has been appointed company surgeon to the Chicago and Alton Railroad, with headquarters at Bloomington.

Dr. A. A. Fitts, oldest physician of the county, was stricken with hemorrhage of the lungs at his home in Batavia and is in a serious condition.

Dr. W. E. Barton, of Wood River, has sold out his practice to Dr. T. C. Smith, of Cressmont, W. Va., and will remove to Collinsville, where he will continue his practice.

The engagement has been announced of Dr. Charles O. Burgess, of Monmouth, and Miss Lura Hardin, of South Bend, Ind. The wedding will take place in the near future.

Dr. J. A. McGee, of Virginia, Ill., has been appointed a member of the Examining Board of Pension Examiners, to fill the vacancy caused by the death of Dr. W. D. Humphrey.

Dr. E. W. Fiegenbaum, secretary of the Madison County Medical Society, delivered an address at a meeting of the East St. Louis Society of Physicians and Surgeons, on the subject, "How to Prevent Insanity."

Dr. M. P. Parrish, of Decatur, has been appointed chief surgeon of the Wabash Railway Employees' Hospital Association, to succeed the late Dr. Moorhouse, who died December 19. Dr. Parrish has been the surgeon in charge of the Decatur Wabash Employees' Hospital.

T. D. Doan, M.D., of Scottville, has been obliged to give up his practice and the secretaryship of the Macoupin County Medical Society, to enter the Modern Woodmen Sanitarium at Colorado Springs, Colo., as a patient. Dr. Doan has been particularly active in society matters, and his misfortune will be greatly regretted.

INJURY TO DOCTOR

Dr. R. A. Mathew, of Morrison, Ill., sustained two broken ribs and other bruises, when his automobile turned turtle and pinned him beneath it.

REMOVALS

Dr. W. H. Ludewig has removed from Rock Island, to Foley, Ala.

Dr. C. W. Hall has removed from Kewanee to 1110 White Building, Seattle, Wash.

Dr. J. W. Calvert has removed from Dwight to Peoples Bank Building, Bloomington.

Dr. W. W. Haven has removed from O'Fallon to 3540 N. Grand Avenue, St. Louis, Mo.

Dr. Henry B. Beeson, 3900 Cottage Grove Avenue, Chicago, has removed to Peoria.

Dr. Frederick Ludwig, U. S. Navy Station, North Chicago, has removed to Government Hospital, Las Animas, Colo.

NEW INCORPORATIONS

Fort Dearborn Hospital and Chicago Anatomical Society, Chicago; educational and general contracting; incorporators, Frederick Greenbaum, Maximilian Spatz, Michael Nelson.

Chicago Medical Service Company, Chicago, $10,000; to conduct a hospital, furnish medical and surgical aid, etc. Incorporators, E. J. Dougherty, Frank Schmidt and David Phillips.

Consolidated Chiropractic College, Chicago, $2,500; practice of mental, physical and drugless healing. Incorporators, D. W. Medcalf, Elsie Merkle and Anna Z. Kirwan.

NOT FOR PROFIT

Mercy Dispensary, Chicago; conduct a laboratory and clinic for charitable purposes. Incorporators, George W. Hochrein, Charles Louis Mix, Richard J. Tivnen and Ph. H. Kreuscher.

MARRIAGES

ISAAC MOORE, M.D., Alton, to Miss Lila Luckey, of St. Louis, December 9.

J. J. PEARSON, M.D., of Pontiac, to Mrs. Grace Deedrich Tilton, of Long Point, December 18.

CHARLES ALEXANDER, M.D., of Champaign, to Miss Mary Lateer, of Paxton, January 1, 1913.

PHIL GRIESBAUM, M.D., of Lebanon, to Miss Elizabeth Glanzner, of Trenton, January 2, 1913.

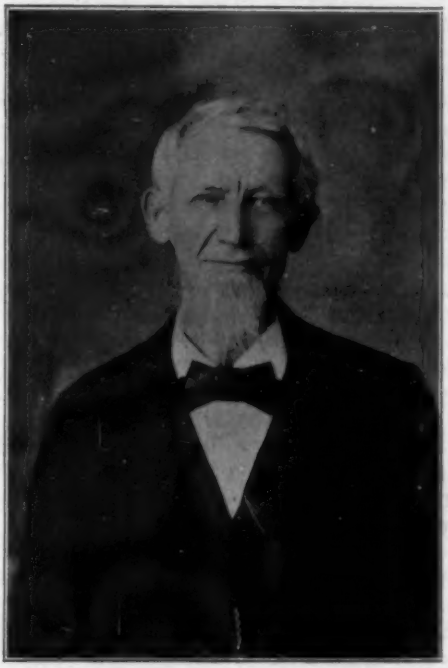
ROSCOE CONKLIN WHITMAN, M.D., to Miss Jessie Edith Collins, both of Morris, December 14.

ALVA SOWERS, M.D., of Chicago, was married to Miss Nina Vittum, of Ottawa, December 17, 1912.

FREDERICK P. COWDIN, M.D., of Springfield, to Miss Margaret Barlow, of St. Louis, Mo., December 16, 1912.

OBITUARY

THOMAS WESLEY SHASTID, M.D., of Pittsfield, died at Augustana Hospital, Chicago, December 6, 1912. Dr. Shastid was born August 26, 1831, at Old Salem, then Sangamon County, a town made historic by the fact that Abraham Lincoln was postmaster and storekeeper there early in his career. His ancestry was French Huguenot on his father's side, and English on his mother's side. His mother was a cousin of Ninian Edwards, the first Governor of Illinois. The family moved to Pittsfield in 1835, where the doctor resided until his death. He was the oldest



THOMAS WESLEY SHASTID, M.D.

practitioner in that county and one of the oldest in the state; he served as president of the Pike County Medical Society; member of the Illinois State Medical Society, and was a member of the Board of Examining Surgeons for Pensions for Pike County. He was a contributor to medical periodicals in the early days of medicine in Illinois, and one of the most successful and best known doctors of Pike County. His sons, William A Shastid, of Pittsfield, and Thomas H. Shastid, of Marion, are well known physicians in their communities. The interment was made in the Pittsfield cemetery, the Masonic Lodge participating.

DEATHS

JOHN LEHMAN, M.D., of Carmi, died at his home in that place, January 17, 1913.

W. A. GROVE, M.D., died January 9, 1913, at his home in Galva, Ill., after an illness of one year.

JOSEPH S. HUDSON, M.D., died at his sanitarium in Canton, Ill., December 17, 1912, after an illness of five months; aged 63.

W. H. WALLACE, M.D., died at his home in Harrisburg, January 7, 1913, aged 66 years. Death was due from heart trouble.

ELI HOLBROOK GALE, M.D., University of Pennsylvania, Philadelphia, 1865; of Chicago; formerly of Aurora, died December 14; aged 65.

JOHN PRIESTMAN (license Illinois, 1877), a practitioner since 1855; formerly of Neponset, but a resident of Chicago since 1885; died at his home, January 1, from intestinal obstruction; aged 83.

JAMES J. EGAN, M.D., College of Physicians and Surgeons, Chicago, 1906; an ambulance physician of the Police Department; died at the Cook County Hospital, December 22, from pneumonia; aged 31.

WILLIAM PATTON, M.D., of East Moline, died December 28, 1912, at the sanitarium of his brother in Montreal, Canada, where he had been since November, receiving treatment for heart trouble. Deceased was 52 years old.

WESLEY DAWSON, M.D., formerly of Homer, Ill., but of late years a resident of St. Petersburg, Fla., died at that place December 30, 1912. He was born in Pennsylvania and was a soldier of the Civil War. The body was brought to Homer for burial.

FRANK RAYMOND WHEELER, M.D., Northwestern University Medical School, Chicago, 1903; a member of the American Medical Association and American Academy of Medicine; died at his home in Auburn, Ill., December 21, from pneumonia; aged 35.

W. O. SMITH, M.D., of Kinmundy, Ill., died at the Old Soldier's Home in Quincy, Ill., December 20, 1912, aged 75 years. He graduated from the Ohio Medical College, 1873; a veteran of the Civil War, Company 1, 40th Infantry, Ill. Had practiced in Kinmundy for thirty-nine years.

F. J. JENKS, M.D., for twelve years assistant superintendent of the Northern Illinois Hospital for the Insane at Elgin; head of a sanitarium at Rockford, Ill., died December 25, 1912, at a hospital in Aurora, of heart trouble. Dr. Jenks was a noted alienist, and at the time of his death, was 49 years old.

WILLIAM STANDING, M.D., Missouri Medical College, St. Louis, 1871; for ten years a member of the faculty of the Physicians and Surgeons College, and a former practitioner of Coulterville, Ill.; for twenty-seven years a practitioner in children's diseases in St. Louis; died December 15, from pneumonia; aged 66.

HOSEA H. MOORE, M.D., died at his home in Fairfield, Ill., January 8, 1913, after an illness of several months with heart trouble. Dr. Moore was born in Washington County, Ill., November 18, 1842, and lived for a long time at Lebanon, Ill. He was a graduate of the University of Michigan, and a member of the Illinois Legislature in 1890.

E. K. SHIRLEY, M.D., of Whitehall, on January 10, slipped on the ice, and striking his head, rolled into a ditch partly filled with water and was drowned. Dr. Shirley was the son of the late Dr. G. Y. Shirley, of Jacksonville. He is survived by four children and one brother, Dr. H. B. Shirley, of San Diego, Cal. Dr. Shirley was 57 years of age.

A. T. HENTON, M.D., of Bloomington, died at his residence in that city, January 5, 1913, after an illness of three weeks; aged 65 years. Dr. Henton's death came just a week after the death of his wife. Deceased was born in Washington Court House, Fayette County, Ohio, January 19, 1848. In 1853 he came to Illinois with his parents and settled near Old Town, where he made his home until 1891, when he moved to Bloomington. He was a graduate of the Cincinnati Medical College.

J. J. MCELROY, M.D., for many years a practitioner of Rossville, Ill., died at the home of his daughter in Decatur, where he had been spending the winter; aged 84 years. Dr. McElroy was born near Cedarville, Ohio, in Greene County in 1827, and for fifty-five years was a practicing physician; he was surgeon in the 125th Illinois Infantry; graduated from Starling Medical College, Columbus, Ohio, in 1857, and then entered Ann Arbor for two years' study. After graduating from Ann Arbor, he entered the College of Physicians and Surgeons in New York City. He is survived by his wife and two children.

H. W. MOOREHOUSE, M.D., of Danville, died December 19, 1912. For over twenty years Dr. Moorehouse had been chief surgeon of the Wabash Railway, and was largely responsible for the excellent hospital system of that road. He was 68 years of age; a native of Fountain County, Indiana. His father was Dayton C. Moorehouse, who afterwards removed to Danville and became sheriff of Vermilion County. Dr. Moorehouse was a veteran of the Civil War. He is survived by his widow and daughters, the Misses Katherine and Margaret. A large attendance at his funeral was an eloquent tribute to the esteem in which he was held.

NEW BIOLOGICAL LABORATORY

The handsome building we are illustrating has recently been added to the group of biological laboratories of H. K. Mulford Company at Glenolden, Pa.

The building is constructed entirely from basement to roof of hollow tile and concrete, making it a fireproof structure throughout.

It is divided into departments, each department being a unit, and complete in itself. The east end of the building is devoted to the handling of serum and globulin products. On the first floor bleedings are received from the bleeding-room, serum or plasma is removed from the clot or from the corpuscles, as the case may be, and the product stored immediately in cold-storage rooms belonging to this group.

When the serum or globulin has been tested and is ready to be finished, it is delivered to the group of antitoxin and serum filling rooms.

The bulk stock is kept in cold-storage rooms connected with this group. Immediately adjoining the twenty filling-rooms is the labeling- and packing-room for serum and globulin products. This group also has its own cold-storage rooms. Elevators at each end of the building convey the completed packages to the shipping-rooms. After inspection and checking off against a duplicate set of records, shipments are made.

Each of the twenty filling- and serum-rooms is supplied with washed and filtered air. The special apparatus used for this purpose is guaranteed to remove 98 per cent. of suspended matter from the air supplied to these rooms. Not only is the air filtered, but its humidity and temperature are controlled, thus giving the employees the benefit of the best possible working conditions.

On each floor glass partitions between the halls and rooms permit the demonstration of the work to visitors without their entering the rooms themselves.

New Biological Laboratory of H. K. Mulford Co.

The laboratory floors are of asbestolith. The advantage of this material is that there are no seams or cracks and is impervious to fluids. It partakes more of the nature of wood than of cement, and because of a cushiony layer beneath the surface crust, is more acceptable to employees than cement floors.

On the lower floor are the stock-rooms. The sterilizing-rooms are in a separate building well supplied with ventilating sky-lights.

On the third floor are found the lecture-room, library and museum.

The entire plant is arranged and managed under the unit system. A separate building or group of buildings, or in some cases portions of larger buildings, are devoted to the preparation, standardization, packing and shipping of each product. Each unit is in charge of scientific experts in their particular branch of bacteriology. Cold-storage rooms supplied with cold air from a central refrigeration plant form part of each individual unit arrangement. This makes it possible to keep on hand a large stock of biologicals without danger of deterioration, so that the company is prepared at all times to supply these products and to cope with the enormous demands often created by epidemics of the various infectious diseases.